

2 Pallas

By Rochelle Jann

BOOK ONE

"2 Pallas is the second asteroid to have been discovered (after Ceres) and is one of the largest asteroids in the Solar System. With an estimated 7% of the mass of the asteroid belt, it is the third-most-massive asteroid. It is 512 kilometers (318 mi) in diameter. It is likely a remnant protoplanet." - Wikipedia
...it is also in a very unusual orbit.

*She dreamed of falling. Falling down an infinitely deep well
whose black walls lit only by fireflies that she had never seen
and stars that she had. Falling forever.*

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Rochelle Jann

Printed in the United States of America

Third Printing: Jul 2023
Amazon

Atarah's stomach did a flip-flop. Disoriented, she woke. Opening her eyes, there was a hand right in front of her face. Instinctively, she swatted at it, sending the glove tumbling away. They were on the float. Freefall again, which she disliked. Preferring the one-sixth gee acceleration that mimicked her home's gravity in Armstrong City on the Moon, now millions of kilometers away. The Drive was offline again.

She reached over, feeling where he had been, cold now, in her bed, their cocoon. Atarah stretched her short, slender legs and leaned into the range of his A/V field. A vid was still playing.

With a finger touch, she froze the vid as she thought, shaking her head and pressing her thin lips into a smirk, 'How can he watch these silly old android soap operas? They are so fake!'

She climbed out, stretching her lithe, young body, drifting away from their nest and wiping her narrow face and bald head with a cleaner towel, then floated towards the core tube. She passed by the shower and toilet, suppressing the urge in her bladder. Zero gee made hygiene a hassle. Her pajama shirt drifted up, exposing her narrow waist and flat belly with Polynesian skin the color of hot cocoa. Her long fingers plucked an undergarment floating in the hallway, frowning, thinking they were his, but then suppressing a giggle when she discovered they were hers. Last night. She stuffed them into the recycler as her elongated toes wrapped around a foothold. Bits and pieces of debris floated here and there. Obviously, they were not tidy housekeepers.

Hearing no alarms, she assumed Pilot must have shut the Drive down under another unscheduled maintenance. Not good.

"Jabin, what's happening with the Drive?" Atarah questioned into her wrist term.

Without waiting for his reply, "Pilot, what is the status of the Drive?"

The Pilot Artificial Intelligence (AI) consisted of three hypercomputers scattered in three locations around the Cecilia. Each processor was the size of a shoebox but more powerful than every computer on Earth combined just a century ago. Any single one could operate the entire ship, if absolutely necessary. Still, they continually voted together, offering high redundancy and reliability.

Pilot responded immediately with a holo display of diagnostics. Jabin replied before Atarah could digest the data.

"Well, top of the mornin' to you, my love. Feel free to get your ass down here sometime today."

She hated that word, which is why he used it.

"Love you too..." replying sarcastically as she saw that Pilot had shut down the Drive due to a thruster variant.

Actually, the two teens were head over heels (quite literally now) in love. But after being in a tin can for weeks now, kidding had become natural.

‘Down’ was relative in freefall but always meant towards the stern Drive Pod, and ‘up’ was towards the bow Storage Pod. They were usually in the Living Pod, mid-ship of the hundred meter long Cecilia Payne. They were headed to the asteroid 2 Pallas, where Atarah’s father, Seth Branson-Kahale, managed an exploratory mining team.

A few years earlier, he had discovered that this particular asteroid contained an unusually large amount of lithium, osmium, and rhodium, all rare metals. Along with oxides to split for oxygen and helium³ for their fusion reactors, 2 Pallas was very valuable, even if difficult to get to.

Atarah and Jabin had been paired several years earlier, at age 12 and mated at 14, back at Armstrong City on the Moon by her mother, Naarah Kahale-Branson, and his mother, Caare Kane-Gowon, and had been working towards this trip almost since then.

Atarah and Jabin had replaced the two Blue Ion crew on this journey. Not just to see her father after several years, but to lend her training in atomics as her father’s engineering group assembled the automated mining station. Her mom had convinced Seth that Atarah knew more about nuclear physics and fusion engineering than anyone else on Luna, even at the tender age of only 17. She ought to, considering she had studied the field since she was ten.

Jabin, too, was highly trained in engineering, particularly with plasma propulsion and robotics. The two were as capable as any of the Blue Ion team in Armstrong City, even if low on practical experience. You only get experience by actually doing, was their final argument.

Atarah twisted her small body and pushed herself through the core tube floating down towards the Drive Pod, where Jabin was. Jabin had been involved in the Cecilia’s propulsion system design for nearly as long as Atarah worked with her studies. He was half a year older than Atarah and half a head taller. With the aid of Armstrong’s AI predictive analysis, their two mothers had paired their profiles when they were just children.

The two teens were well suited for each other, almost yin and yang together, and would have likely made good parents. But like most of the off-world youth, they were both sterile; sterilized when they were very young. Radiation damage from growing up outside of a magnetic bubble, like Earth’s, just created too many DNA replication errors from cosmic and solar radiation. And no one wanted to live underground all the time. But like all children, their DNA was captured and stored when they were born. They could have babies, built from a mix of their genes, but gestated on Earth by surrogate just as the two of them had been.

Had Atarah and Jabin grown up on Earth, this would have been unnecessary. But, their parents, living on the Moon, had wanted the babies with them. Atarah's first space flight began only a year after being born. Right after the doctors were confident the gene-spliced IQ accelerants and rad resists had taken properly.

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Atarah's first memories were of her home in Nursery in Armstrong City, the only 'city' on Luna. She remembered her mother holding her and her father talking with the doctor. They were about to give her the injection that would create her Brain-Computer-Interface, BCI. All children received the injection at around two years of age so that the interface's growth would coincide with their young minds' development. A year would pass for the process to complete, being partially neural-biological and partially nano-electronic. It tied into the centers of emotion and thought, much like the optic and auditory nerves did to their respective portions of the brain.

Early BCI designs were connected to thought processes only. However, researchers soon discovered that learning needed emotional impact to anchor memories for best recall. A side-effect of this meant that emotions could be transferred with or without memories; shared feelings. Once the child's BCI was deemed functional, they graduated from Nursery to School.

Atarah's dad was surprised when his daughter showed integration at a mere six months after injection. Her mom was skeptical and tried to resist Atarah's beginning School at only two and a half years old.

Naarah only relented after Seth snuck a language lesson to Atarah, and she began to speak in her mom's native Tahitian. Atarah still remembered the 'heated discussion' that her mom and dad had after that. Language lessons were normally applied only after age three or four and only after School completed preliminaries.

But within a year, Atarah was already matching five-year-olds in math and science, along with fluency in the four major languages spoken in Armstrong City.

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"Jabin, I see you messed up the Drive again!"

She kidded him as she smoothly slid into the Drive Pod work area, grasping a handhold. She was finally used to moving in weightless environments, even though they had only been in freefall a couple times.

He ignored her for the moment, "Pilot, please re-initialize thruster D4 and hot fire at 1% when possible."

Then to her, “Hi sleepyhead, you missed all the fun. You can’t blame me on this one. I think we just had some crap collect on the trinary positive grid. Gotta get after those guys in Propellant next time we are in Armstrong.”

“Ha! That’s two years from now. They’ll have invented something better by then.”

She came up in front of Jabin, grabbed a handhold with one hand and the back of his head with the other. She pulled the two of them together and held his lips to hers for as long as she wanted.

He reached around, seized her pajama-covered bottom, and pulled her against him as the rest of his body did a slow-motion collision with hers. Each of his hands squeezed a cheek, and his legs intertwined with hers. He floated, holding onto her, no longer touching the wall. She let go of her remaining handhold, drifting off as they kissed.

“Initialization complete. D4 firing in three, two, one, initiated”, said Pilot.

The gentle push of the single plasma thruster at minimum power was nearly imperceptible to the two young lovers.

Jabin broke their kisses for a moment, “Pilot, continue hot fire for five minutes, then rerun diagnostics.”

He went back to kissing Atarah. It was a rare treat to get to float weightlessly together, but duty called. She explored his lips with a long, slender finger.

“Jabin, I need to go look over Pilot’s findings to be sure we didn’t miss something. This is the second time a thruster has caused the Drive to go offline. I want to send your data back to Blue Ion to have them look at it as well.”

“Atarah, I want to make love to you in zero-g. We haven’t gotten to...”

She smiled, “Stinker, this is important. MORE important. Anyway, we’ll have a day of weightlessness at mid-point.”

“That’s weeks from now, my love!”

“Silly, we will be fucking in quarter-g soon,” it was her turn to use a word he did not like.

Her mind wandered, “Can you imagine having someone on top of you in full Earth-g? UGH!”

He ignored her vulgar term.

“That would be like MAKING LOVE to an elephant!” he responded.

“A what?”

“Big, grey skin, trunk, tusks...”

Atarah laughed and untangled herself from him. She pushed off, sending him backward into the wall as she was propelled forward, deafly catching a handgrip and sliding into the core tube ‘up’ towards Control. As she left the Drive Pod, she heard him make a strange noise, like a sick tuba horn.

She flipped her wrist term, "Jabin, you only wanted me down there so you could mate again."

She did not wait for a reply from him, smiling as she cut the connection.

Pilot interrupted, "Hot firing of thruster D4 complete. Diagnostics underway. Results in two minutes thirty-five seconds."

In the Control Pod, hardly more spacious than the front seats of a rover, Atarah went over the Drive report, before and after. The change was easy to see, but the cause eluded her. It did not look like Jabin's 'crap'. Pilot's data inference showed several low probability vectors but requested more information that neither she nor the sensors could provide here in mid-flight.

She recorded a message to Blue Ion and attached the data. She also recorded a message to her mom, just telling her that Jabin is horny all the time, and she might have to give him an antiandrogen shot. She laughed at that idea as she thought about it.

The two of them alone together for months inside a living space of what was no larger than a two-story yurt would test their compatibility as well as their sanity. Even the confines of living in a small lunar city seemed vastly more spacious than the Cecilia.

"All diagnostics complete. No anomalies. Orbital recalculation complete. Suggested initiation in five minutes twenty-eight point three seconds. Drive level of 98% of maximum is required to return to nominal arrival in 56 days 11 hours, 5 minutes."

"Pilot, what is the G load for this calculation?" Jabin's voice came up from the core tube just as he entered Control.

"Zero point three three gravity."

"Ugh," he replied, "elephant."

"Small elephant. 1/3rd gee isn't THAT bad!" Atarah replied, knowing that it was near twice their normal 'weight' on the Moon.

She continued, "Pilot initiate at the calculated time. 98% Drive", then to Jabin, "At least we can eat real food, and I can take a shower! Not like now in zero-gee. It's only for a day or two, then back to normal 1/6th gee."

She strapped into a control chair, more for the safety of floating out now or for falling when the Drive kicked in. Jabin did the same. She scanned the status screens out of habit. The magnetic bubble around the Living Pod was at normal strength. She reflected on that. It helped shield them from the solar wind's radiation and even a fair amount of cosmic rays.

If they could figure out how to expand that bubble to the size of Armstrong City on Luna, then... She paused, a little sad. Then they could have babies. On the Moon. And nurseries wouldn't need to be deep underground. And Jabin could make her

belly grow round instead of its current flat low-muscle, low-fat self. She absently rubbed her bare midriff.

Pilot interrupted, "Drive to 98% in three, two, one, initiated."

She sank into the chair. She felt heavy, bloated, pregnant.

Jabin spoke up, "I'm going to go get breakfast. Atarah, come join me?"

"I want a shower. Come join me?" she replied.

He smiled.

They had to hand-over-hand down the core tube now, grabbing every other handhold to slow their descent. At least going down was actually down now and more manageable than going up.

In the Living Pod, she did little bounding hops, not quite as prominent as the "Lunar Bunny Hop," but not like Earth walking. She had only seen vids of walking on Earth, her bones and muscles too weak to actually go there. She did not care. She loved Space. She also loved Jabin. She had better love him, 56 more days of just the two of them in this container ship.

Typically, this run would have had two Blue Ion pilots to deliver the rest of the 'crew'; twelve car size Boston Dyn construction robots along with much-needed supplies that they could not construct. Including feedstocks of elements unavailable on the asteroid needed for the replication printers. Everything was stowed in the forward Storage Pod, whose shield and bulk helped protect the two weak humans from oncoming micro debris and a fair fraction of incoming radiation.

They would be traveling at a couple hundred thousand kilometers per hour at the peak of their journey. Thus, even a salt grain size object would hit the oblation shield with significant force. Moreover, the Cecilia Payne could accelerate at one-third gee for years; full velocity would start approaching ten percent of the speed of light.

Their ship's namesake, Cecilia Helena Payne-Gaposchkin, had proposed, correctly, in her 1925 doctoral thesis that stars were composed primarily of hydrogen and helium. Her idea was initially rejected, almost offhandedly. How could those elements put out so much energy? Now Atarah knew that humans could travel beyond their Solar System to another of those stars with the help of the nuclear hydrogen fusion driven plasma engines they had constructed.

She felt hands removing her clothes. She smiled, returning to the here and now.

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When Jabin turned 10, he decided to become a robotics engineer following his father, Jree, instead of an exobiologist like his mother, Caare. Caare worked remotely with an ultra-clean lunar lab that was a kilometer from Armstrong City. Jree's work took him to the orbital facilities of Blue Ion and Boston Dyn often, but Jabin was still

too young to follow him there. So he lived with his mom in their small apartment in Armstrong City.

He did find his mom's work fascinating because some of the nano-sized robots functioned much like the extremophile bacteria that his mother worked with. Her lab contained bacteria and viruses gathered from Mars and Europa. These could never be brought to Earth for fear of contamination. Some of these specimens lived in conditions that were more suited to the interiors of nuclear reactors than to Earthly environments.

Jabin's simple nanobots were almost as hardy now, though they had been designed to not be self-replicating after the disastrous events of the 2130s. But most of the robotics that Jabin worked with his father on were of human or larger scale. His father designed space-faring capable robotics, working contracts with Blue Ion and Boston Dyn corporations.

Of course, young Jabin was still merely beginning. So mostly, he just watched his father and continued his in-depth studies with School. Entire semesters of robotics engineering compressed into a few days of School mem lessons.

It was at School that young Jabin first noticed the little girl whose name was Atarah. Even then, he felt an attraction. But, it would be several more years before he and Atarah would be brought together.

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Outside the shower compartment in the Living Pod, Atarah waited as Jabin removed his Clothper shirt, crumpling it and hers, and tossed into the recycler. He looked at her sapphire green eyes, slightly enlarged for better night vision, irises partially oval, mimicking cat eyes. Human genes altered slightly, following their animal analogs.

She smiled into his deep blue eyes, similar to hers in shape, if not color. Her hands glided down his hairless body. Like hers, hair had become more of a nuisance in space. Having to be cut, and requiring precious extra water to clean, with loose hair floating and clogging filters. Thus another slight gene modification. Seeing everyone bald from head to toe was so normal that watching vids from Earth made the people look like they were all barely out of the Stone Age.

The pair did have tattoos; hers a Polynesian design on one side of her head, signifying her roots. Another was a starburst in the center of the small of her back. She was a child of the stars.

His body had nearly a dozen tattoos scattered in no apparent order. He had described the reason for each long back in Armstrong City when they had first been Mated at 14, under their parents' approval.

Since their pairing was not necessarily for having babies, but for love and companionship, their matching had been predicted to have a strong bond, with over 90% full lifetime longevity of about 60 years. Radiation and accidents were hard on offworlders.

Neither the young Atarah nor Jabin had ever thought anything unusual about the arrangement. The two kids had been predicted a match, successfully so far, at the tender age of 12. Thus, they had known each other for about five years now.

Nevertheless, Jabin always stared in awe of his beloved Atarah each time he saw her unclothed. His eyes flowed down her, over her perfectly rounded, cereal bowl breasts that would never sag under the gravity of Earth. He watched her breath stretch her ribcage in a slow rhythm with lungs that required less oxygen. His eyes drifted down to her stomach, soft and flat, with her 'innie' belly button he so loved to touch.

Her hips, with pelvic bones protruding on each side and diving to her unexpectedly thin legs, where muscle was not needed.

Her toes and fingers were longer and thinner than Earthers, again thanks to slight gene alterations. He loved how she could clench her toes, using them to hold onto a handrail, in the midst of lovemaking. She was only four and a half feet tall, and he only six inches more, again due to slight gene tweaks, more for conserving space and weight in a world where space and weight were at a premium.

He was six months older, now 18, so he loved to kid her about being the elder of their pairing. 'Oh, Atarah, see! You DO like OLDER men!'



Seth guided his crew to their first assay target from the Dragon, the space tug that had brought them to the asteroid. 2 Pallas, even at over 500 kilometers in diameter, had such low gravity, they couldn't actually walk normally on it, nor orbit it, but had to continually use station-keeping jets to stay in position.

Droids drilled anchor bolts into rock and strung cables to anchor mining equipment, replicators, and their supplies as the crew guided them. The men and women likened it to working on the side of a rock cliff, except that you could step back to admire your handiwork without fear of falling. Though, from time-to-time, they did have to send a droid out with its jet pack to retrieve an errant tool or piece of rock as it flung away in a slow motion hundred meter arc.

Their main task was to take core samples of each survey area to examine for mineral content. The best spots would then be programmed into the automated mining equipment. They also had to assemble the Mass Driver that would send the stream of material back towards the processing plant that orbited in the asteroids' main belt. It would take months for each thousand-kilogram "slug" to return, but at

little cost and fully automatic. The Mining AI handled the complex task of orbital mechanics.

There were thousands of survey points and thus years of work, even with droids and automation. It was expensive and time-consuming, but with trillions or even quadrillions of kilograms of potentially useful materials, the return was enormous. It would last for a century or more.

“Seth, there’s a few targets that are giving, well, unusual readings.”

“Dragon, please assay and report,” Seth requested.

Dragon’s AI provided the data retrieved from the mining droids after only a few seconds. Seth examined the results.

“Yeah, does look different from other areas. But, I suspect just something from a meteorite impact. Not very big. Don’t worry about it right now.”

The team continued its work as Seth sent a message back to Armstrong City to have their AI check over the findings. He added a message to his wife and daughter, knowing he was late replying to them.

“Naarah, I’m glad you and Atarah are doing well. I miss the two of you so very much, though I still am not terribly thrilled over having Atarah and her mate, ok, Jabin, sorry I’m jealous, come out here. Nevertheless, yes, I accept it, and I have to admit that she will be a welcome sight for me. Though, it’s probably good that she will have Jabin and me to keep these roughnecks away from her. The guys complain that the women in our small group are harder than the rock they drill! Anyway, sorry about that last part. I guess some of their bad manners are rubbing off on me. Atarah, have a good trip and see you soon. Love to all of you!”

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After only a few days into their journey, Atarah had discovered that space travel was about as exciting as watching hydroponics grow. She had grown up on Luna, watching all the space operas of the day and even several amusing ancient ones. Space battles, aliens, black holes, faster than light travel with a new adventure each episode.

Now she knew better. It was more like being stuck inside an elevator for months. You got in. You were bored stiff. You got out. Sure, you could look outside, though, their vehicle had few real windows, only vid screens instead. But the starry view, however magnificent for the first hour, faded into the background after that. Even early astronauts watched the Earth floating below and did not pay much attention to the stars around them.

But luckily, there was one thing for a seventeen-year-old girl to do with her ‘older man’.



She remembered their first pairing at 14. She had been so scared, so excited. Their parents had given them their Mating Party, though her dad could only send his best wishes from hundreds of millions of kilometers away. There had been music and dancing. They had recited words and poems to each other. There was the breaking of the regolith glass, the tossing of the paper pedals, the first kiss, well, first public kiss. A ring of real flowers, rare and expensive, encircled her head. She did a special dance around him, her hips swaying, matching the motions with her hands and arms. She had danced as his eyes watched her slender, lacy veiled young body while her shadowed eyes watched his.

Atarah wore a traditional Mating dress of intricately textured and embroidered lace. All interwoven with threads of iridescent and electric colors, which glowed to her moods and swayed to her moves.

The dancing dress covered her from just below her neck to shimmering floor-length folds. With multiple slits rising from ankle to hip level, so thin bare legs could be seen in glances as the young girl moved. The soft colors shifted from virginal white to blushes of pink, to heated reds and cool blues. Bracelets and anklets sparkled and shimmered with their electric glow as she danced. Long painted fingers and toes curled and flexed in sensual patterned displays, beckoning to him and to all partiers to see and appreciate.

She had practiced her dance in private for weeks, perfecting her motions. Atarah had displayed herself for all to admire, as small floating droncams captured every moment and every angle. A Mating Party was a rare and happy event in Armstrong City.

He swept her off her feet as they left the party and went to their room, which their friends had decorated in flowers and papers and sparkly things. He had gently lain her on the bed.

The ritual 'Tearing of the Clothes' began.



Jabin watched with amazement at the robotic spiders weaved the ribbon that would eventually reach down from where they were nearly 50,000 kilometers from the surface of the Moon. The Lunar Space Elevator project was now well underway. This would become the ideal way to move cargo and raw materials to and from the lunar surface. However, since the climbers would take days to traverse the distance, even at their 500 kilometers per hour speeds, only people with few credits or lots of time would use it.

This would, though, significantly reduce launch costs, not to mention the pollution being generated by lunar launches. Each added to the “lunar atmosphere” that had been detectably increasing in density by unhappy lunar scientists.

The asteroidal counterweight was already in place. While the fibers' raw materials were stockpiled, waiting to be spun into the thousands of kilometers of ribbon needed. A similar project on Earth was also underway. Combined, they would vastly improve space commerce.

However, Jabin was not interested in economics or pure research. He liked robots, and these spiders were explicitly designed to construct this massive, yet in the end, simplistic project.

His father had been able to get Jabin a position as a young intern at the Obayashi Corp engineering labs. They constructed the robots and designed both the Earth and Lunar elevators.

Jabin sat one day in his little workshop in Armstrong City when a woman appeared.

“Ah, excuse me. Would you happen to be able to help me with this?”

She held out a small shoebox.

He looked up from his microscope, first at the box, then at the woman. She was obviously an Earther. Her jet black hair was in a tight bun, and her dark eyebrows and eyelashes highlighted her face. She was almost two meters tall and looked to be in her twenties. Even with her hair, she was striking, skin the color of dark chocolate, but Asian facial features. Dark narrowed eyes, thin mouth with pure white teeth, small pointed nose, and high cheekbones. She spoke initially in Afrikaans, relatively rare in Armstrong City, but switched to Anglo-Slavic, the more common language used on the Moon.

He then looked into the box. Inside was a little robot that looked like an Earth cat, even with fur.

She continued, “Sorry, I’m Faraja. I work for Blue Ion. They said you might be able to help me.”

“I’m Jabin. I can look, but I’ve never seen such a robot.”

“I know who you are. You and Atarah are going to be on the Cecilia to 2 Pallas. I’m in the logistics group. We work with your father.”

He looked again at her, blushing a bit at his notoriety and glad she was not one of the crew they had planned to replace.

“Oh, ah, can you tell me what’s wrong with it?”

“Actually, I think it's just the power supply. It's kind of old, and the cell may be dying.”

He took it out of the box, and the robot cat started to purr, but the actuators for its legs barely moved, leaving it half-sitting.

“I see. Is this a toy?”

“Oh, no! It's my pet. I have had it since I was very young. It's a supertoy.”

“I've heard of them but never had one. Never seen one here. Let me look.”

She bent over him, watching as her pet was being opened up and examined. He felt her closeness to him, smelling her perfumed skin next to his. Jabin tapped into the RoboticsPedia from Earth to retrieve specs for the device. After a few moments, it returned all the data he needed.

“Humm, I think we can use one of our micropiles for power and just build an interface for it.”

He had the ARMIE AI design an interface circuit and sent it to the replication printer.

“Oh, that would be great. I didn't realize just how attached I was to Chiumbo until now.”

“Chiumbo?”

“My pet.”

He laughed, but then, “Oh, I think Chiumbo will be happy soon. The micropile will likely keep him running for at least another ten years. Then just swap it out. These are pretty standard now.”

“Oh, that's wonderful! I love it!”

With that, she leaned over and gave Jabin a kiss, not on the cheek but right on the lips. A kiss that lingered for several seconds.

“Thank you so much, Jabin! I didn't think it would be so simple.”

Jabin was still recovering. He had never been kissed by an Earther girl.

“Ah, I... we need to go pick up the part from the printer, and we can finish... I mean, I can install it.”

Chiumbo soon woke and started purring and meowing as it saw his mistress, weaving back and forth as Faraja petted it. It lightly walked among the tools on his workbench, sniffing each of them. Jabin was struck at how surprisingly lifelike the supertoy pet was, as he studied it from his roboticist point of view. The robot came over to him, meowing as it looked up at him. Almost instinctively, Jabin petted the cat as it wove around his hand.

“Oh, Chiumbo likes you! You have a new friend.”

Faraja leaned over Jabin again; this time, her kiss was on his cheek, but she whispered into his ear,

“Remember, Jabin, Earth girls are easy!”

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Armstrong City's Artificial Intelligence was ubiquitous and continually monitoring and maintaining all the systems in the city. It was a critical component, massively redundant and self-programming. Everyone used it, even if they did not

realize it. Even using the BCI required the AI. It controlled all systems, including everything from a simple text message or voice communication to the complexity of regulating the life support systems for the entire population.

It dispatched repair droids for equipment issues, maintained the hydroponics, managed logistics for supplies, food and water, controlled all other essentials, and even ran the replication printers.

Early on, the AI had been established to not interfere with day-to-day human lives, including not “spying” on BCI activities, even if the activities were illegal. However, there was a fine line between “spying” and “monitoring,” which was inevitable as well as necessary.

Only if something considered truly dangerous (such as someone replicating a weapon or bomb or seriously talking about suicide or murder) would the AI contact the appropriate persons. It would not take direct action against a human, even to stop a crime, unless specifically requested, unless others were in immediate danger. It had never had to take drastic action beyond locking a door or blocking access while waiting for security to arrive in the thirty years of operation.

However, it did generate reports on individuals' compatibility and stability, a necessity in such a closed and dangerous environment as their lunar base.

ARMIE, the AI's nickname, was like a benevolent All-Seeing Eye.



Life aboard the Cecilia moved slowly as the vehicle continued its half-billion kilometer journey, a mere flea jump in the scheme of the vastness of Space.

Atarah turned to climb into the tiny shower cubicle in the Living Pod but was stopped with a squeal as Jabin grabbed her and pulled her against him. Her 45 kilos Earth weight, now only 15, made it easy for him to lift her.

Jabin opened a low-level neural link between their BCI's. She felt faint stirrings of feelings in her mind as gigabits of data encoded with his own emotions and base thoughts flowed to her. He specifically kept the feed at a bare minimum to not overshadow what she was feeling from below her belly. She allowed the return link to open. Her feelings flowed into his brain, and she felt him swell in desire as her emotions hit him.

She was tempted to fully open the link to flood his mind with hers, drowning his yearning with her own desires. They had done that previously, with mind-altering results and migraines afterward. She resisted the temptation this time and closed her eyes to absorb the duality of emotions as they made love.

The sounds of love making and cooling fans were the only thing heard throughout the ship as it accelerated closer to their destination. The Cecilia Payne continued its journey outwards from their home, all overseen by Pilot.



ATARAH'S DIARY

Day 1

This is INCREDIBLE! It's so cool being here, finally headed to see my father after nearly two years! I love being alone with Jabin. I see the Moon and Earth together now as we head away. Pilot is taking good care of us.

Day 2

I had forgotten what "space food" tasted like. Though we can create nearly any type or flavor of a meal using the molecular printer, they come out a bit strange. Back home, we had real hydro fruits and vegetables. Here, they're printed, of course. Imagine cherry-flavored peanut butter or corn flavored noodles. You get the idea. Mom, I wish I had eaten more of my vegetables back home.

Day 5

I think we have 'christened' every part of the ship now. Jabin is insatiable! But I love him so. Pilot runs everything for us. We eat when we want, do whatever we like, play games, make love. Though, I'm kinda sore now.

Day 9

It's kinda dull here—nothing to look at outside. Jabin is acting silly all the time now. He wears only his briefs anymore. I think he hopes it will get a rise out of me, seeing him half-naked. Ok, it does, but I don't tell him.

Day 10

I've taken up his idea of clothing, so I just wear my undies too, just to taunt him. Ha! We watch lots of old-time movies, mostly ancient science fiction. I love that one with the 'alien' popping out of that guy's chest. So cool!

Day 11

I received a message from Abra. She and Camber were Mated! I'm so happy for them. They said they would invite us to a Trysting party when we get back. Jabin will like that: three girls and one guy!

Day 12

Jabin found this vidbook of, well, positions. Kama something. So we are trying them. It's... interesting.

Day 16

I am SO SORE! Every muscle aches. I needed more yoga exercise for this! I think we finished that book. Well, everything we could do from it. Oh GAUD! Pilot has probably watched all of it! And recorded! I hope we don't 'corrupt' poor Pilot. The folks at iAI might not approve.

Day 18

I HATE Jabin! He's mean to me. He makes fun of me. He doesn't help me clean the kitchen, bedroom, or toilet. He plays practical jokes on me all the time. AND HE FORGOT OUR MATING ANNIVERSARY!

Day 19

I LOVE Jabin!! I'm so embarrassed! TODAY is our anniversary, not yesterday. He gave me his grandmother's gold locket necklace. He is so SWEET! I didn't have anything as nice to give him. So... But he didn't mind. Especially afterwards.

Day 21

This trip is BORING! BORING! BORING!

Are we THERE yet?!?

◆◆

Jabin climbed down to the lower level of Cecilia's Living Pod, looking for Atarah. There really weren't many places someone could be. Their tiny world now made Armstrong City seem huge. At times though, she liked to hide from him, maybe as a game, but sometimes just to get away. He did so once in a while, too.

He found her sitting on the lab floor, legs crossed, arms on each knee, index finger touching thumb, eyes closed. Her breathing was slow and deep. He had wanted to ask if she wished to go for lunch but instead backed away, knowing not to disturb her meditation.

He climbed up into the Control Pod, lying in one of the couches, staring blankly at the holo displays around him. He closed his eyes, thinking he probably should take up meditation as well, but his mind rarely calmed. He played a babbling brook mem with his BCI, leaving his eyes closed.

A tap on his shoulder roused him. Opening his eyes, Atarah was smiling at him.

"Have a good nap?"

He rubbed his eyes, now realizing he had fallen asleep for nearly an hour.

She asked, "Want lunch?"

He smiled, climbed down, and followed the few meters to their little galley, absently watching her wiggle as they went.

◆◆

Armstrong City was actually not much of a city. Only about 500 people lived there, of which nearly half worked in mining operations and rotated back to Earth every six to twelve months. The rest were engineering techs and scientists from universities and companies globally. Thus the city was a mix of languages and cultures from all over the Earth. About two hundred people were permanent

residents, eventually no longer able to return to Earth without significant effort. Most did not want to return.

There were also usually ten or twenty tourists at any moment in time, being led around by one of the tour companies. Though costs were down, each paid hundreds of thousands of credits to come. So there were always at least a couple celebrities (usually minor), mem'ing and vid'ing everything they saw. Beaming it back live to their eager fans on Earth.

Tourists stayed at the only lunar hotel at Armstrong aptly named 'Moon Shine Motel.' The exorbitantly expensive hotel rooms were small and sparing, though did include floor to ceiling vid screens that showed the lunar surface, or for the homesick, scenes from all around Earth. The hotel was actually underground, so had no real windows. In addition, for the guests' protection, the floors, walls, and ceiling were lightly padded, so when they jumped or fell, they would bounce. Even the furniture was designed with no hard edges.

A few honeymoon (or otherwise involved) couples tended to stay in their rooms after the first day or two of tours, with low gravity lovemaking being more interesting than yet more gray rocks and the fifteen minutes it took to tour the city.

The one primary tour outside, which mainly consisted of looking through the rover's windows at the barren gray landscape on the way to the Apollo 11 Memorial, seemed to curtail excitement, at least for the couples. Though, there was always at least one super NASA fan who had to retell in excruciating detail the Apollo program's adventures over two centuries ago. Except they always seemed to intermingle the particulars of that landing with the founding of Armstrong City. Which, according to them, happened right after Apollo and not over a century later. The tour guide would usually offer them a mem recording to "refresh" their memory.

The second most exciting place for tourists was the underground gym. Large enough for them to break every Earth-bound Olympic record in high jump, shot put, weight lifting, gymnastics, blah blah... Luckily, the Auto-Doc could handle the occasional broken bone and sprained muscles when they tried to overachieve.

For the well-heeled, several tens of thousand credits got a private trip outside in a lunar excursion suit to hit a golf ball a thousand-plus yards. Most tourists were surprised that there were no swimming pools or even hot tubs; water was just too scarce to waste even for the wealthy.

Along with humans, there were well over a thousand robots that did most of the hard or dangerous work. Even the human "miners" were engineers and industrial techs who operated and maintained the robots and never went into the mines. Most of the robots looked nothing like humanoid shapes. Instead, they were self-driving heavy equipment or smaller crab-like multipurpose droids. These could crawl

through tight places, repair, weld, or otherwise work in and around the multitude of instruments, telescopes, power plants, and more.

Inside the city, Auto-Docs handled a fair number of cuts, lacerations, and broken bones, even with all the precautions taken. Many first-timers forgot that even though something weighs a lot less on the Moon, it still retains its mass. So getting a hand or foot crushed is an unfortunately common occurrence.

Newbies also forgot not to touch anything that had been outside for a while as it could be near-boiling hot or blisteringly cold. Thus, it could give instant burns or frostbite. The Auto-Docs handled anything from toothaches and sore throats to appendicitis and cancer inoculations.

There were less critical but very important to well-being, beauty bots, delivery bots, gardening bots, and more. They handled day-to-day tasks that would be too expensive to “waste” a human on. However, some of the citizens of Armstrong did similar work as a sideline.

Life in Armstrong City for the kids was like living at a research university located at the South Pole. Remote, but quite safe indoors. Small but surrounded by interesting people. Always immersed in learning new things.



In their decorated Mating Party bedroom, the lights were now a soft pink. The walls and ceiling lit in a starry pattern of the lunar sky outside. Fourteen-year-old Jabin found the tiny marker on Atarah’s dress near her collarbone that signaled that this is where he should begin the tear. He pulled the tab as she lay on the bed staring at his face, smiling.

Atarah had a wonderful time at their Mating Party. But she was anxious now. This was it; their first physical lovemaking was about to occur. Her mother had talked about it, quietly discussing as her young teen daughter asked questions that School had not answered.

He pulled, and her dress's material tore as easily as tissue paper yet had not budged during the entire time at the party. The rip passed between her breasts, still covered in the thin now light pastel purple coloring of her dress, her favorite color. Jabin saw her belly button appear, rising and falling to nervous breaths as the tearing continued. He paused but did not touch. Touching would come later. He continued the tear, exposing a lace panty, pure titanium white in color, a symbol of her virginity. He remembered the times how close they had come to the two of them not being a virgin.

He also remembered when they first met.

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Atarah had just turned 12 when her mom introduced her to Jabin.

"Atarah, this is Jabin," Naarah had said as she shyly shrank back into her mother's arms.

"Jabin, this is Atarah," his mother, Caare, had offered, pushing him forward.

He timidly held out his hand. She looked at it, reached out, and they touched for just a moment. They both knew that this was their first touch, signaling the beginning of their future pairing. She blushed and drew back as her mother smiled.

Actually, Atarah and Jabin had seen each other in School, though girls and boys were kept relatively separate during those early years before Compat testing completed. She had recognized him when her mother started talking about him earlier. Her mother had explained that their match rating was very high. She was right. Within a few weeks, the two were seeing each other nearly every day. By 13, she and Jabin had become inseparable.

Atarah's father had gotten to meet Jabin just before he had left for 2 Pallas months earlier. A sad good-bye for Atarah and her mom for the next several years. His departure had also brought Atarah closer to her mother and, more importantly, to Jabin.

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Naarah, Atarah's mom, sat across from little six-year-old Atarah.

"How was your day, Atarah?"

"Ok, I guess."

Atarah pushed her vegetables around on her plate.

"That's not much of an answer. I heard your group is going outside next week."

"I guess."

"Eat your food. Otherwise, it will be recycled, and you will get to eat it next month."

"Ok," she continued pushing her peas and carrots, ignoring her mother's warning.

Naarah knew something was up, "What's the matter, honey?"

She got up and picked Atarah up, taking her away from the table. Atarah hardly weighed more than a few kilograms in Lunar gravity, so she was easy to handle.

"I'm sad. Daddy isn't here."

Being in asteroid mining engineering, Seth was gone much of the time.

"Atarah, daddy sends his love, but I have a surprise for you."

Little Atarah still had a headache from the calculus lesson from School, and was not in the mood for surprises. She squirmed to get down.

Naarah could tell Atarah wasn't interested, but she knew a secret that would brighten both their days.

"I think you will like this surprise. Come on, let's get some ice cream."

Atarah half-heartedly resisted and felt too tired to go to the café. Still, her mom insisted, putting her little sandals on her and carrying her out of their small apartment.

Most of the main corridors and large rooms in Armstrong City were repurposed mining tunnels. After the minerals were extracted, the walls, floors, and ceilings were sealed and coated with insulation. All of the residential areas were brightly colored with ever-changing vid displays and exciting artwork. Only the more utilitarian areas were left in their original gray.

Naarah finally let Atarah down, and the two walked in little bounding hops, hand-in-hand to the local café. There were several café's around the City, each oriented towards a typical area of Earth. There was a North-Merican style one, a Euro-Asian, an Africana, and an Asia-Pacific.

They did not have 'neighborhoods' in the City, other than the Perms and the Earthers, if you could call them that. The Earthers were the men and women that rotated back, while everyone else was a 'Perm,' regardless of actual ethnic background.

Independent countries did not exist on Earth anymore but were all states or ethnic groups. People lived wherever they wished. As most companies had become more powerful than their original nation-states and completely global, it did not matter. Ethnic groups still clustered, and some 'nations' tried to retain their fake independence. But, Perms considered all Earthers as one group and them as another.

However, as far as Atarah was concerned, she lived here, and here was the Moon. And her mother was dragging her to get an ice cream she didn't want.

She sat at a table, her mom next to her. Others were seated around as well. Not too crowded this evening.

A voice came up behind her, "Miss, would you like chocolate or vanilla?"

Her mind stirred. That voice. She turned and looked up.

There was her father, holding two ice cream cones.

Atarah squealed; all sadness was instantly gone. She leaped up so fast that she left the ground and was a meter in the air. The two ice cream cones didn't survive the impact as her father grabbed her in mid-flight.

Atarah hugged her daddy tightly, still squealing in his ear, his arms around her as her mom tried to clean up the mess. All three were happy!



Jabin always met Atarah at their favorite café. After sharing a treat, the two would sneak down to the hydro-gardens and lie under the vegetable plants where tomatoes the size of cantaloupes and cantaloupes the size of watermelons grew. The noise of blowers and waterers and tending robots drown out their whisperings. They talked endlessly about their lives, interests, and friends, usually holding hands the entire time.

Then one day, he kissed her. He just leaned over, she looked up, and his lips touched hers. Their first kiss. They both blushed but returned for another kiss. And another. Soon, days later, their visits to the gardens were kissing, punctuated intermittently with talking about their day and their future. Their future together.

“Jabin, I miss my father so much,” she whispered between kisses.

“We need to go see him,” he announced as if this was certain.

She laughed. She had not even been off Luna, barely away from Armstrong City. Here Jabin was saying they would go nearly a half-billion kilometers to the asteroid 2 Pallas! She laughed again. He kissed her, bringing her thoughts back to him.

“I love you, Atarah,” he stated as if it had always been.

She giggled, “You always say that...”

Before she could complete her thoughts, he rolled over on top of her and kissed her, licking her lips lightly with his tongue as he did. Her arms went around him. He moved one leg between hers, their hips against each other. They French kissed, and he began to sway his body against hers, softly rocking on her.

His 55 kilo Earth weight, reduced to a tiny 9 kilos on the Moon, felt like no more than a heavy blanket to her. He kissed her earlobe and neck. One hand went to her breast and softly massaging it through her shirt. Their courtship had advanced to ‘second base’ and beyond. A hand crept down her trembling belly and then to her pants.

They wore only thin Clothper shirts and pants, both sealed by just touching the edges together. Their young teen heat flamed as he advanced. His long thin fingers began creeping down her pants. She squirmed, wanting but scared. Too soon. Not mated.

Suddenly, she felt him jerk, again, then again. He made little ‘UGH’ sounds each time as he thrust against her. She looked shocked, not quite understanding, but then realizing what had happened. She pushed him away, harder than expected, and his head hit the bottom of the hydro tray with a bang.

“Hello? Who’s there?” a voice called.

The two lovers, blushing and giggling, tried to stifle their noises as they rolled apart. They snuck away as quickly as they could. She snickered, looking at the wet spot on Jabin's pants as they left the garden.



Like most teens, Jabin was always on the lookout for something new and exciting to get into. He and several friends discovered several empty storage areas, one quite large. He moved boxes out of the way as his friends laid out some old insulation blankets over the floor. As his friends sat and talked, Jabin checked out some of the side corridors.

"Hey guys, look here!"

"What? More junk? What you find, Jab?"

"Come look. Not sure what this is."

Curious now, Einar and Gunnar, both brothers, got up and wandered over to Jabin.

"Ok, what? What's so big a deal?"

He pulled back the tarpaulin covering it.

"It's a mining bot!" Jabin said, recognizing the pile of machinery.

"What's it doing here? They haven't mined here in years."

"Probably broken or something," as he finished pulling off all the covers.

"It seems kinda small for mining."

"Oh, it's likely just for utility tunnels or maybe test drilling."

The mining bot was about the size of a garden tractor but had large cutters and drill bits on the front.

"I wonder if I can get it to run..."

Jabin climbed around to the control panel, wiping the dust off the display panel. The start button was prominent, so he pressed it.

Suddenly the bot lurched up, standing nearly as tall as the boys. Tracks underneath extended, obviously where the broken rock would be pushed away as it drilled. The console screen lit.

"It's really similar to a rover's controls."

"Jabin, I don't know," said Einar.

"You probably ought not to do this," parroted Gunnar.

He ignored the two brothers and hit autopilot.

With an incredible noise, the bot moved forward, the grinders hit against the storeroom's wall. Rock and dust started flying everywhere as it began drilling into the rock wall. The three boys leaped backward.

"Frack, Jabin! What did you do?" Einar yelled.

The other boys came running in to see what was going on. The racket was now too loud for any of them to even yell anymore. Jabin tried to reach the console, but the flying debris bounced in every direction as the boring machine dug into the rock wall. It was already nearly a half-meter in when suddenly the machine halted dead. Their ears still ringing, with thick dust floating all over the room and the boys. Their wrist terms all came alive.

"This is an emergency broadcast from Armstrong City AI. You have triggered an unauthorized operation. The machine has been disabled, and personnel have been alerted. Please step away from the mining robot to a safe distance. End of message 2185-08-22 23:43UTZ"

The other boys scrambled back and ran up the corridor towards home, leaving Jabin behind. He knew it was fruitless to try to run or hide. ARMIE knew who did it.

He did not have to wait long.

"Jabin? That you?"

It was one of the mining engineers.

"I should have known. What the frack were you doing? That thing could have killed you!"

"Sorry, sorry. I didn't expect it to start boring!"

The engineer examined the bot, "The energy packs are nearly exhausted. This thing would likely have died in just a few minutes more. I can't even get it to pull back. Have to recharge it first."

Jabin downturned, knowing that he was going to be in trouble with his parents... again.

Jabin mumbled, "Do you HAVE to tell my dad?"

"Jabin, shit, I ought to," as he continued examining the bot.

He looked around, "You clean up this mess. I do have to put it in the reports, but, hell, nobody reads that stuff. But you owe me!"

Jabin had no problem agreeing on that.

The next morning, Jabin was back at the storeroom. This time Atarah came with him. He found that the bot was already gone. Only the rock debris was left, along with a quarry trailer and a broom and shovel.

"Jabin! What a mess! You're so silly at times. I guess I have to keep you in line," she kidded him.

A droid could have cleared all this rubble, but he knew this was his punishment. He started shoveling as Atarah swept.

"Jabin, you better do something nice for me after this!" as she discovered keeping the dust from just flying around was not easy.

However, Jabin was more absorbed in the realization that ARMIE had not only known they were there, that it had let him start the machine and engage it without interfering. Only stopping it after it began to bore into the wall. It seemed strange to

him that ARMIE did not disengage the machine the moment he started it. It seemed to be rather lenient towards illegal or dangerous occurrences.

"ARMIE, why didn't you stop it earlier?" he spoke into his wrist term, intrigued at the AI's thinking.

"There was no danger."

Even Atarah thought that was rather farfetched.

"No danger?" she asked, looking around at the chunks of rock.

He wondered, "If we were not in this room with the mining bot, would you have allowed it to continue?"

"Yes."

Jabin laughed, "Even if unauthorized?"

"Correct. Unless a danger to human life was indicated. You were only endangered because the mining debris shield was not installed."

Jabin realized that ARMIE had access to the mining bot's imaging system. So not only did the AI know everything that was going on (over the entire City?), but also that its principle of non-interference seemed, well, rather loose.

Jabin felt like they were all just rats in a maze, with the psychologist looking on.



A year after Atarah and Jabin had been Mated, Atarah watched her mom as she put on makeup and dress. Naarah was wearing a rather revealing Victorian vamp costume, a two-toned wine red and black satin bodice dress, and a petticoat covered in black lace, bows and ribbons. Her legs and feet were covered by black thigh-high silk stockings and black pointed-toe heels.

Atarah giggled when Naarah put on the tall blond wig, not used to seeing her mom with hair. A necklace and earrings of Victorian jewelry completed her outfit.

"So, how do I look?"

Atarah giggled, "You look funny!"

"Mom, what's it like? The Trysting party?"

Her mom smiled, "Well, we all get together, dress up, and ah, well, have fun with each other. For this one, everyone dresses Victorian steampunk."

Atarah knew there was more to it than that. Anyone could have a party, but Trysting parties were like Mating Parties in a way. Except that everyone invited joined in the fun. There would be e-drugs and drink and lots of kissing and making out. But she had never been to one since they were usually for adults only, including mated couples like Seth and Narrah.

Like every teen, she decided to bypass her parents and go straight to the source...

"ARMIE, can you tell me about Trysting parties?"

ARMIE's reply was immediate, if not satisfactory.

“Ever since the eradication of the last remaining sexually transmitted diseases, control of pregnancy, and the ritual of Mating for the young, society had become significantly more lenient towards sexual mores. That was a significant driving reason for mating Off World teens early. This being the understanding of the need for compatible pair companionship at an early age. Even after pairing off, adults and teens alike could still dally freely with others, such as after mating “sowing of the oats” rituals and trysting parties being the most popular.

Trysting parties are typically held in a private location and usually consists of fewer than 20 people, sometimes as little as three. Though, these smaller ones are generally considered “sowing oats” rituals. They may include costumes or themes as well as food, drink, drugs, and entertainment. Participants may range in age, but usually no younger than 16 years of age for consent purposes. Related persons may sometimes be included since no procreation is possible.”

Atarah was surprised at that idea. Trysting with relatives?

ARMIE continued, “Adverse factors: Jealousy still exists but was rarely an issue as the invention of the BCI had created the ability for partners to understand and empathize with each other in ways that were undreamt previously. These have become more of a way of showing care and affection to close friends.

Beginnings:

Trysting parties likely had its early roots thousands of years ago, in Rome and Greece, and even in the “key parties” of the 1960s over two hundred years ago.”

“STOP!” she didn’t mean for a history lesson, just a peek into what went on.

But Atarah found it funny and neat that her mom would attend a Trysting party.

“Mom, are you going to... make love with someone?” Atarah giggled like the schoolgirl teen she still was.

Naarah just smiled and winked, “Well...”

“Poor dad, stuck on that rock all by himself!” Atarah kidded her mom.

“There are others there with him, too, several dozen. I’m sure he won’t be lonely! And you will be there soon, too.”

Atarah blushed, “MOM! Not in THAT way!”

Her mom just smiled and shrugged and went about her tasks of getting ready.

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On the Cecilia, Atarah finished her exercises. Coated in sweat, she wiped her face and padded out to get something to drink. Peeking into the little lab, Jabin was intently working on some project of his.

“What’s that?” she looked at the small robot on the table.

He grunted, staring into a microscope, “There!”

He rose up, and on the table was a funny shaped robot about the size of a fist.

"It's my supertoy."

She looked unconvinced. To her, it looked like a bald metal rat with no tail.

"It's a rabbit. Well, it will be once I add its fur and everything."

"Looks like a rat to me."

"Wait, let me activate it. Then you will see."

He turned on the micropile, and the little robot stretched its legs. She could now see the back ones were longer than the front. It did a tentative short hop and immediately fell over.

He quickly muttered, "It's not finished. Pilot, upload the updated balance module. Atarah, I'm still working on the software with Pilot."

The robot rolled itself upright and sat back on its back legs. Suddenly, it restarted and hopped several times, stopping only when it reached the edge of the table. Its head moved smoothly back and forth as if trying to determine a way off the table. Its back leg came up as if to scratch, but maybe its way of thinking. It turned around and looked at Atarah and Jabin.

"Wow, that's amazing! Its movements are so real. But, sorry, Jabin, it still looks like a rat."

"Don't make fun of Thumper!"

♦♦♦

Growing up, Atarah did not really have that many toys. Nevertheless, she felt EVERYTHING were her toys. She could play with million credit telescopes, labs full of all kinds of fun things like pulse-electron microscopes, micro-robotic arms, holographic imagers, biochemical analyzers, DNA splicers...

One time, her dad took 13-year-old Atarah out in a lunar construction rover to a remote site a hundred kilometers away from the city to replace some mining equipment. When they reached the flat plain where the graded road stretched straight for dozens of kilometers, Seth stopped.

"Atarah, would you like to drive the rover for a bit?"

Her eyes lit. She had the School lesson and driven a rover virtually, but never in reality. Her dad switched off the autopilot and gave Atarah manual control.

Construction rovers were large wire-wheeled electric vehicles powered by hydrogen fuel cells. They could run for days, providing environmental support for up to a dozen passengers. They could also carry several thousand kilograms of gear. With their massive wheels, the control cab sat over three meters in the air, juttied out from the vehicle and provided panoramic views of the surrounding landscape. Typically, the rovers were fully autonomous vehicles but could easily be switched to manual, semi-autonomous mode. Otherwise, the "driver" just sat in the cab in case of an emergency. Stick controls and holo displays surrounded the driver. For this

trip, it carried only Seth and his daughter, Atarah, both strapped in the control cab's suspension seats.

"Ok, just start off slow until you get used to the controls."

Atarah nervously placed her hands on the steering and throttle as her lessons had taught her. She felt so small for driving such a massive vehicle. She eased up the brake and increased the throttle, and they started rolling along the unpaved lunar roadway. She turned the steering, feeling how the rover responded.

"Atarah, you can go a little faster if you like."

She realized they were only going about 5 kilometers an hour so far. Atarah increased the throttle, and their speed slowly increased. Feeling more confident, she added more throttle. Then more. The electric motors started to whine. Thirty, forty, fifty kilometers per hour. The rover bounced in slow motion bounces as their speed increased evermore.

On the flat, featureless lunar plain, with no references, it was hard to tell what speed they were actually going. Atarah's hands gripped the controls and her eyes were locked on the endlessly linear path in front of her. Not completely smooth, they hit a more significant bump, bouncing the two passengers inside the rover. Seth looked over at the velocity indicator.

"Oh my, Atarah! Slow down! We're doing 80!"

Atarah's face was shining brightly with excitement. She never realized rovers could go so fast. It was not like there was traffic or even any speed limit signs. For that matter, no signs of any kind, just a straight, flat road. The rover's holo maps showed them exactly where they were, with two parallel lines converging into the distant mountain range many kilometers ahead of them.

Atarah felt powerful, exhilarated by her newfound capabilities. She pressed the throttle to max. Now climbing past 90, edging up to 100. The huge rover and its two passengers hurdled forward.

Suddenly, the power was cut, and the rover started slowing dramatically. Atarah frantically looked over the displays, thinking something had broken. She looked at her dad, face red, scared.

"Atarah! You can't do that!" Seth had cut the power and switched back to auto-pilot.

"You could have killed us, Atarah Kahale!"

"Dad! Sorry... I just wanted to see how fast we could go."

"You are not a racer pilot, and this isn't a hypercraft! ...And NO! I am NOT going to let you become one!"

Atarah smiled, still energized with adrenalin. Her hands finally letting go of the control handles.

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Jabin powered down Thumper and put it away, to be finished later.

Atarah noticed several other versions, all only partially completed.

"Why so many?"

"Those were experiments. Took me a bit to get it right."

"You just leaving them like that?"

He shrugged, turned around to face her. Now, he became more interested in other things. Looking at Atarah in her exercise outfit and still covered in sweat, he stood up and leaned in to kiss her.

"I'm all yucky!"

"Yes!"

"Incorrigible!"

"Yes."

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Young children at Armstrong City usually stayed underground, protected from radiation and the lunar vacuum's harsh environment. Both the Nursery and the School had special airlocks that were always in place in case of the outer dome's catastrophic failure. Unlikely, but if a 'large' meteorite (anything larger than a pea) or an errant spacecraft component hit the tough triple-layer dome, the last thing the engineers wanted were parents worried about their child's safety over their own.

Due in part to this, visits outside the dome were highly controlled. The kids were not even allowed in standard lunar enviro suits. Instead, they used 'hamster balls' with two separate airlock-like entrances and a dual environmental system. Each was tough enough to withstand nearly anything the Moon could offer. You could roll around on a bed of knives without any problem, and the air recyclers would last for days.

Field trips onto the surface were always carried out with nearly one-to-one, one space-suited adult to one hamster ball. Most of the children's caregivers were actually in their teens as well, just a few years older than Jabin and Atarah.

Each ball usually contained a maximum of two children, but it was almost always just one for teens. The balls were about two meters in diameter and, while heavy on Earth, were not much more than big, person size beach balls in the low lunar gravity. Each was motor driven and gyro-stabilized. They were completely clear and had an anti-static charge to repel most of the lunar dust from sticking, so the view was entirely unobstructed.

Of course, there were vehicle-based field trips as well, but the kids loved rolling and tumbling around in the balls, playing as much as keeping track of their Teacher's lessons. Even though the BCI interfaces gave them near-perfect virtual reality memories of anywhere on the Moon or Earth, there was still nothing like really being in a place, especially when you could have fun.

One night, Atarah got a message on her wrist term 'Meet me at airlock 4'.

It was supposed to be sleep time, so she knew something was up. She snuck out of her home without telling her mom, something she had done before, and made her way to the airlock.

"Atarah, over here," whispered Jabin. His head peeked out of a hamster ball, "We're going out!"

There were two others there as well. Atarah knew them; Laandan and Maahir, both caregivers, as well as working in climate engineering. Both were a few years older than Jabin and her and both paired together. They were in lunar excursion suits but had their helmets to their sides.

She looked skeptical. This was against the rules, even with trained 'adults'. And doubly so, going out at not only during City 'night' but actual lunar night as well. Most work and all field trips took place during the lunar day when the lighting was bright.

She looked around for another hamster ball, "Jabin, I don't want to... not a hamster ball. Anyway, I don't see one for me."

"In here, with me!"

She didn't understand. Teens always got their own ball, considering that there wasn't that much space in them. And girls never went in one with another boy, knowing that they would be tumbled around together in there. Then it dawned on her.

Jabin helped her as she climbed in with him, giving him a sheepish little giggle. In Earth gravity, you could get hurt; knees and elbows, but here, at one-sixth gee...

Laandan stuck her head into the ball, "Now you two don't get too friendly in here! This is a PG tour!"

Atarah blushed and giggled as Jabin just smiled.

Laandan sealed the ball as Maahir checked the systems.

Atarah had previously changed out of her sleep clothes into a tight-fitting jumper, typical for teens going around in, particularly at night. And particularly when sneaking about.

They had left the radios off to not signal anyone that might be monitoring, so Maahir put his helmet against the hard, clear airlock of the ball.

"Ready?" a muffled voice called to them.

Jabin nodded his head and replied, "Yes," and the two wrapped themselves around each other. Atarah hadn't expected this; she thought that they would stand

side-by-side. Suddenly they were rolling as the electrics started under Laandan's control. The two teens tumbled in the light gravity, bouncing like little fluffballs. At one-sixth gee, they were hardly heavier than a small child.

Atarah let out a shout of glee as the two tumbled in slow motion, Jabin holding tightly to her. He tried to kiss her, but the initial tumbling was too rough for attempting such, so they just held on to each other and laughed at themselves.

Maahir had previously alerted his friend in Systems Op, who had turned off the airlock alarm reporting. It seemed this was popular with teens in Armstrong.

They cycled through the lock and rolled outside with the two older ones watching and smiling at the two kids as they bounced in slow rolls. Laandan knew this was fun as she and Maahir had done it before they were paired, as well. Doing this against the rules, at night, without permission, and without parents keeping a close eye made it all the more fun.

The two tumbled end over end, laughing and giggling, trying to hang on to each other as they rolled out onto the darkened lunar surface. They stopped. Jabin turned Atarah over on her back.

"Look up!" he announced.

The first thing Atarah saw was the Earth. It was near full, a bright blue and white marble shining beautifully in the sky. She looked all around them. The entire lunar surface appeared easily visible but ghostly lit by the reflected Earthlight and their enhanced eyesight. It was stark, totally quiet except for their breathing and the whisper of the air scrubbers. Dark blacks turned to dozens of shades of grey as her eyes adjusted. Looking away from Earth, her irises opened to the dark sky. She could see the stars, crisp and sharp, unblinking.

Jabin whispered to her, "Atarah, what do you think?"

She replied with just, "WOW!"

They lay side by side contemplating the universe.

Laandan touched her helmet against the ball's airlock, "You two ok?"

They laughed at the scare and replied affirmatively.

"Then, let's go for a little ride!" she replied and started again.

The two tumbled a turn or so, but Jabin got to his feet and helped Atarah balance more or less standing up, walking with the ball.

"Watch this!" Jabin stretched spread eagle, hands and feet bracing against the 'top' and 'bottom' of the ball, and suddenly he was doing a cartwheel, spinning with the ball. Atarah lost her balance and tumbled into him on the next partial revolution. The two crashed about in slow collisions.

Jabin laughed, "I think we need to do this together."

The two got their balance in the slow roll of the ball, and both spread eagle back to back, doing lazy cartwheels as the ball carried them. Atarah watched the Earth spinning in the sky until she had to close her eyes.

They stopped, and Laandan again touched her helmet to them, "Ok, get ready. Signal, and we will push you off!"

Atarah looked surprised at Jabin, then looked in the direction he was staring. Her eyes went wide.

"NO! Don't you DARE!"

This was absolutely against the rules. They were sitting at the edge of a crater wall. It was only a dozen or so meters deep but looked like an endless cliff in the sharp shadows of night. Jabin nodded his head to Laandan and grabbed Atarah tightly.

Suddenly the ball went over the edge, and they were falling, tumbling head over heels, screaming in fear and delight as they rolled and bounced bounding over rocks and bumps. Laandan and Maahir watched as the ball fell away in dead silence with two teens, mouths wide open, but not a sound, bounced in slow motion around and around into the darkness of the crater.

An eternity of tumbling later, they hit bottom and bounced high into the vacuum of space. The world around them spun in every direction as the ball's gyros fought to dampen their wobbles.

Atarah screamed again as they bounced once, twice, three times before rolling to a stop. Tears of fear and joy wetted her face, and she pronounced numerous profanities in many languages at her boyfriend. He smothered her swearing with kisses until she quit fighting. The excitement heated the two into a battle of lustiness.

In their tight jumpers, Jabin could feel Atarah's heavy breathing, still panting from the adrenalin of the fall. His hand ran up and down her torso, covered only in her jumpsuit.

Jabin broke their kiss. He knew that all he had to do was run a fingertip down her jumper, and it would open. He did, unable to resist. She did not stop him. She quivered to his touch as his fingers traced her bare skin.

Atarah felt touches of his lips on her body. She felt the coolness of the deadly cold lunar surface only millimeters away under her back. She could almost feel the ultrasonics shaking the dust they had collected off the ball's surface. She stared up at the sky, Earth still there and dark shadowed grey crater walls around them. Stark, cold, empty, desolate.

Jabin moved down, touching her belly. She felt anticipation. She wanted him to touch her but was scared. They shouldn't. Not yet. She stopped him, whimpered. He relented. They were alone together in a vast, totally inhospitable world.

A bump. A laugh, "You two! I said this was PG!"

Jabin and Atarah giggled, breaking the sexual tension. She quickly refastened her jumper as Laandan and Maahir rotated the ball, adjusted the motors for high torque and low speed, and told the two to get ready for the ride back out of the crater. The

crater had a wall collapse on one side, so going up was much more manageable, though slower than the wild ride down. They returned to the City dome uneventfully.

Atarah, in her bed again, dreamed of her pairing day.

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Eventually, Jabin and Atarah convinced their moms that they were capable of going on the long journey to 2 Pallas. With the help of her father's acknowledgment of their abilities, they started their training with the Blue Ion company instructors. The School lessons had taught them all the systems and requirements needed, though nearly everything was handled automatically by Pilot, the Cecilia Payne's AI. In fact, the AI could run the ship entirely, even with contingencies, without human help. Still, it had been trained to work with people, in this case, with Jabin and Atarah.

Atarah lay on her couch as the Aries lunar excursion vehicle prepped for launch. This was her first trip off-world, and even though well versed and trained, she was excited and nervous. She looked over at Jabin, who acted like he was asleep but then smiled knowingly.

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Atarah had spent the last week before launch with her mom. Naarah had taken off from her work to be with her daughter the entire time. The two were nearly inseparable for that week, knowing that this would be the last time they would see each other, except for vid messages, for over a year.

Late one night, both city night and lunar nighttime, Naarah sat with Atarah, who was curled up on their couch, her head in her mom's lap. They were watching another vid of old-time 'films' that Naarah liked. This one was a nearly two-hundred-year-old Bogart/Bergman, still in its original black and white.

"Mom, what's the name of this one again?" Atarah asked sleepily.

They had a busy day together, doing workouts at the gym, a long, lazy luncheon at the Euro-Asian café, then shopping for gifts for friends, and to take to her dad. Finally, a visit to the optical observatory to look at her destination, hardly more than a dot in the eyepiece.

"Casablanca, honey. Back in the 1940s."

Atarah giggled, "Mom, you always like these period vids, don't you?"

She just kissed her daughter on her forehead and turned back to watching it. Both had tears at the end, though more from knowing they would be separated for the first time for such a long journey than by the old film.

It was after midnight, "Atarah, come on, get up. I want to show you something."

The two put on their slippers. Naarah got a shaw and gave one to Atarah. Even though the City's temperature was the same day or night, it always felt cooler at night. Without a word, Naarah took Atarah, hand-in-hand up to the Park under the central portion of the dome.

"Here, let's lie down," Naarah whispered quietly.

There were only one or two other people off to one side, while the distant sounds of one of the clubs could just be heard. They lay down on the artificial grass that not only looked and felt like the real thing but also even had the smell of being freshly cut. Flowers, bushes, and trees, all artificial yet nearly indistinguishable from natural, surrounded them. The park was like a Disneyland oasis in the middle of their crowded little town.

Atarah and Naarah lay wrapped in their shaws, looking up at the starry sky through the transparent dome. The Earth was just a sliver in the sky.

Naarah pointed, "There, that direction."

Atarah wordlessly knew that was where her father was. And that was where she and Jabin would be going, all those millions of kilometers away.

"I love you, mom."

"I will miss you, daughter."

The two lay quietly, staring at the infinity above them, from a little grass-covered knoll, under a dome protecting them, on the surface of the Moon.



The fusion reactor underneath them released some of its furies in a controlled explosion of expanding hydrogen, pushing the Aries off the surface of Luna. A single Earth-gee force pressed Atarah deep into her couch, six times her normal weight. Still, she groaned under the pressure. After minutes that seemed like hours, the pressure was released, and they were weightless—another first for her. Jabin had been in lunar orbit once before with his father as they worked on the exact vehicle that would be taking him and Atarah to 2 Pallas.

The first sight of their new home for many months was a letdown for Atarah. It was like seeing an antenna tower floating on its side. Webbed titanium and aluminum struts and tubes, with a sphere holding a giant shield at one end and a rectangular box studded with a thousand pipes, three huge cylinders of hydrogen, radiators, and the heavily shielded fusion drive at the other. In the middle was the expandable habitat, already inflated and covered in cables, antennas, spheres of oxygen and other gasses, and more. Instead of many old movies' sleek space ships, it looked more like a junk pile welded together.

Docking and transfer were uneventful as the Blue Ion workers and droids shuttled the last remaining supplies onboard the Cecilia. Everything else was already loaded and prepped. Jabin's dad was there to greet them and help them get adjusted to their new home away from home.

Atarah already knew where everything belonged and all of the details of the virtual instrumentation consoles. But she took time adjusting to floating weightless for the first time as she checked out the cramped Control Pod, directly behind the Storage Pod and Shield, and ahead of the Living Pod.

Jabin had already whispered to her about joining the 'FreeFall Club' sometime before their journey began. She just rolled her eyes and continued with her checklists.

The burn would begin in only two standard days, and there was much to do. Time for mating could wait.



There were only about fifty children and unmated teens in Armstrong. Thus most of them knew each other and played together after School and work chores. Nearly all were "interns", working with parents or others on the multitude of projects that were always going on.

Atarah had met her best friend Abra at School when she was only 3. Abra was the same age as Atarah and had come up to the Moon on the same shuttle flight as a baby. The two played together quite often and grew up together.

When Abra was just 13, her mother had died in a very unusual accident. She had been working long hours in a lab. While waiting for an experiment to complete, she had lain down on the floor to rest. A CO2 scrubber for the sealed lab had malfunctioned. In an innocent mistake of installation, the CO2 monitor was mounted a little too high on the wall instead of close to the floor. The oxygen level at floor level fell with nothing stirring the air. She just fell asleep and never woke up.

It was a sorrowful time for the entire city. Everyone turned out for the funeral, all crammed into the central hall dome. Atarah held Abra close to her the whole time as Abra's father, an engineer on the far side radio telescope, gave a eulogy along with many of their friends.

Several months had gone by since then. Atarah and her mom "adopted" Abra while Abra's father finished his work. The two girls would share secrets. Atarah would tell about Jabin and some of the things they did together. Both giggling at some of the juicier parts.

Abra was still unpaired with anyone yet, and without her father there, it would likely be another year before she would be. As with most teens, she worried that she might never be mated with someone.

Since their little apartment only had two bedrooms, Atarah and Abra shared one bed. One night, Atarah told Abra that Jabin had full access to the BCI network. This included being able to access Compat reports from Armstrong's AI. The School regularly updated information on the children, including running compatibility studies.

That night, Jabin ran the report after he promised not to look at the results else risk Atarah's wrath. He did as promised and sent the unopened results to Abra. Abra was too scared to open it, so had Atarah do it.

Atarah started giggling.

Abra looked at her, "What is it? Who?"

Atarah blushed, "It gives several matches, in descending order of compatibility."

"Well? Who?!"

Atarah looked at her friend, "Well, I'm an 85% match..."

Abra looked at her, thinking she was lying, "Let me see that!" and she grabbed the holo screen.

As Abra read the report, her demeanor changed. Privately, she had felt closer to girls than boys for some time now, but she never really thought about it. Looking back, she realized that she really had not been very interested in boys, at least in that way. She had male friends but was not attracted to them physically.

Abra laughed at seeing Atarah's name. The two looked at each other, realizing that they did have an intimacy together. They just never expressed it outright.

Abra looked at the top entry. The name "Camber Alician" had a 94% match. Both Abra and Atarah knew her well. She was good friends with the two of them. Abra blushed, feeling a flush rise over her.

Atarah looked at Abra, "You two? ...You did! Oh, wow! You already knew this?"

Abra was shy now, "I didn't know this report. But, just a few months ago, we snuck out at night. There's a place. We kinda just clicked."

Atarah leaned over and hugged Abra, then kissed her.

Finally, "So what happened? I haven't seen Camber around."

"She's with her mom working on the ULT telescope project on the far side. Not far from my dad."

Atarah, still hugging Abra, "Oh wow. So...tell me what happened between you two?"

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Ten-year-old Atarah remembered the visit to the hypercollider where Blue Ion created antimatter. She had already completed School mem classes on the collider, including its construction and fusion reactors, but seeing it spread out before her, amazed her even more.

Her father had come with her and the other children on their field trip. They had played games, finding funny shapes in the shadows and rocky ridges and hills around them as their passenger rover headed across the kilometers to the factory. When they arrived at the bluff overlooking the crater that the collider was built in, she was struck by how really big it was. All of it easily visible lying on the lunar surface inside the vast crater. On Earth, giant underground tunnels with massive vacuum pumps evacuating the tubes of atmosphere and protecting it from weather were needed for such colliders.

Here, the collider was entirely on the surface since there was no weather, and a vacuum was all around them. A sunshade kept the magnetic tubes in the nearly steady -200 degree Celsius shadow. Liquid hydrogen lowered the temperature to its superconducting levels. As they went to the central control room, their guides explaining what the children had seen previously during their School, Atarah focused on her interest; the fusion reactors that powered the collider.

The primary purpose of this collider was to create antiparticles, that is, antimatter, for fuel. Whereas older colliders could only create infinitesimally tiny amounts, this one produced over one gram per lunar month. Made possible in part by the perfection of the fusion reactor. The compact spacecraft fusion reactors they used required antimatter to start them. Even this small amount was enough to start (or restart) dozens of reactors.

Atarah never thought it was unusual for a small child like her to be fascinated and already well versed in hydrogen fusion processes and antimatter tech, something that a century ago would have seemed unthinkable.



The launch day had arrived and gone by almost as an afterthought. Atarah and Jabin had said goodbye to their moms and their friends, and the two had hugged Jabin's dad as he said bye to his boy and his daughter-in-mate.

"You two take good care of my ship!" Jree had laughed as they hugged and kissed.

"And Pilot, you take care of my kids and deliver them safely!" he added.

At the required time, Pilot completed all checklists and initiated the Drive to 50% acceleration, 1/6 gee, just like the Moon's gravity. The vehicle slowly increased its orbit as the velocity built. Within a day, they had already headed away from the Earth-Moon system. They would soon be leaving the ecliptic to match the strangely inclined orbit of 2 Pallas, something that would have been almost impossibly energy-intensive prior to their fusion-powered plasma drives.

Atarah and Jabin sat strapped in the Control Pod chairs, watching the holo data screens. With Pilot handling everything, they really had nothing to do. The

excitement of beginning their journey quickly wore off. Atarah would come up to Control every “morning” to look over Pilot’s report of system issues.

“Pilot, display the morning report,” was repeated each day.

As with anything new, there were always minor faults and flaws, but nothing that redundancy, Pilot, and the droids could not handle. Along with these reports, Pilot always provided her with their orbital graph and a telescopic view of their origination and destination. Both now just dots in the star fields. Jabin would usually join her after a little while, greeting her with a joke or two.

“You remember that vid, ah, 2001, with that AI?” Jabin asked this morning.

“HAL?”

“Yes, Pilot is kinda like that. Handles everything. Not much for us to do, except ride.”

“Now, I kind of wish we had hibernated.”

“What! And miss all this FUN!” he laughed, then added, “Oh, but remember what happened to them.”

“Pilot, you won’t do anything like that to us, right?”

“Atarah, don’t ask that!”

Pilot responded without any detectable delay, “Of course not. It would be against my programming.”

Atarah giggled, and Jabin leaned over to kiss her, changing the subject.

“At least there is one thing we can do that Pilot can’t do for us!” Atarah said, releasing her restraints and following Jabin down the core.

The two settled into routines of eating, sleeping... and lovemaking.

They both refused to play chess with Pilot.



Their Mating Party was over. The two were snuggled on their bed, their first full night sleeping together by themselves. The tearing of her once beautiful costume had continued until Jabin reached the middle slit that already rose from her ankle-length dress up her thighs.

Jabin slowly moved down, opening her dress like a flower exposing her where he had seen veiled earlier during her dance, now in full view. He sat admiring his mate.

She was beautiful. She smiled at him with her anime-like eyes staring back, her eyelids colored in bright purple that shimmered like butterfly wings. With no lashes or brows, but instead, sparkles and colors of intricate henna-like patterns drawn with care by a beauty bot. More designs were on wrists, ankles, and above one breast. She remembered being shy as the robot carefully drew the temporary Polynesian patterns onto her.

Her eyelids closed, drooping in softness to his whispers and touches. He opened her dress down her waist and hips. Only her virginal white panties kept her modest. He looked for and found their tear points.

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Just after Jabin's 14th birthday, months before Atarah's birthday and months before their official Mating day, they had been communicating via their brain-computer interface, BCI. Still being young, there were safeguards in place that controlled what could be sent between two people. The interface was supposed to be only used for School, at least until they were old enough and paired. But Jabin had discovered a flaw in its security and, like any teen hacker, exploited the connection.

Atarah was lying in her bed, almost asleep, when she felt a tickling in the back of her mind. She heard a thought, or more like a feeling, like a touch. She felt it strengthen. It was much like a School interconnect request but wasn't. She accepted the request, just as she would at School.

It was Jabin. Her Jabin. She felt him smile. She had not felt such an unusual feeling before. It was intriguing. A thought came into her head, similar to School messages. It told her how to return the connection to him. She did. He felt her giggle at the newfound access. She felt him thinking of her. They shared feelings and thoughts. The access was still low level, like whispers and the touch of a single fingertip. She closed her eyes and focused on her beloved.

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On her very first day of School, little Atarah was shown to a small couch by her caregiver.

"Atarah, close your eyes and relax. Breath slowly."

Her father had already used a Teacher to give her that language class months ago, so she knew most of what to expect. She felt the first stirrings in her thoughts and emotions, like a tickle or a whisper in an ear.

They told her how to accept the neural connection request, so she did. She felt a soft breeze of emotions and thoughts flow over her, like walking from inside a small, silent room into a quiet outdoor party. She took a breath, kept her eyes closed, and listened to the thoughts as they formed in her head. Her first lessons would merely be for orientation and to test what intensity levels she could handle.

The Teacher AI ran diagnostics on Atarah's young brain.

Teacher found Atarah a competent learner, and Atarah hurried her lessons as much as possible, even when they resulted in migraines afterward. She loved

learning new things. She did not know yet, but her future Jabin was also advancing his learning at a pace equal to hers. Both accelerated above their classmates.



Being on the near side of the Moon, Armstrong City always had direct communications with Earth, though the two second round trip delay made for somewhat choppy two-way conversations. People not used to the delay constantly stepped on each other, interrupting the conversation.

So most people settled for messaging, either video, voice, or text. Messaging also made it handy due to time zones. All of Luna, as well as all those in space, used a single time, Universal Time Zone (UTZ), basically, the old Greenwich, England time zone. The Earth had its 24 time zones, so if you forgot, you could end up waking people in the middle of their night.

Since the Moon's "day" is nearly 30 days long, Armstrong had set their city day/night schedule to Earth's 24 hours. Of course, work still ran around the clock with robots and engineering maintenance running all the time. Just fewer people worked during the "night shift". During that city nighttime, insomniacs and teenagers roamed the quiet hallways and hidden spots.

For recreation, there were gyms, an old-time movie theater as well as a holo theater, a multi-purpose arena/music/stage venue, gardens, and of course, a few cafes and restaurants. There were even a couple bars that served several recreational synthetics, guaranteed to wear off within a couple of hours, without headache.

At any of these, anyone could offer their talents at cooking, drink making, dancing, singing, or any other interesting abilities as they saw fit, including a few that were not on the 'menu'.

Most things that Armstrong's citizens needed were constructed by replication printers located in the "shopping" area of the city. You would put in your order, and usually within an hour or two, you could walk down and pick it up.

Items included every type of good imaginable from meals, to clothes, to electronics, to jewelry, to your morning coffee. The printers even constructed custom designed products. The science team was always coming up with new science instruments, while the kids were coming up with the latest fashion statement.

The City had a few security team members that kept the peace and a social committee that came up with ways to entertain everyone. Of course, there was a nearly endless supply of BCI-based entertainment from the savory travelogues to the not-so-savory horror and sex mem recordings. People could tune out the world, lie back, and do a virtual visit to... well, virtually anywhere or anything.

A steady stream of new and exciting BCI, video, and text material came from Earth over the laser links. Terabytes a day to keep the doctor away, they say.

Nevertheless, it was the teens that always found the most ingenious, if not entirely safe or approved, ways of entertaining themselves.



Abra sat hand-in-hand with Atarah in their shared bedroom. She started talking to Atarah about Camber.

"There's a place that we hang out at times. It's a large storage area, emptied when the telescope projects began."

Atarah knew the place. She, Jabin, and some friends had been there together many times.

"Well, there were several of us sitting around talking. One of the boys had previously brought thick insulation blankets for the floor."

Atarah smiled knowingly about those, too. She and Jabin had lain on them, making out. Now she wondered how many other teens had as well.

"Well, one of the boys, you know him, had brought some alcohol. Nasty tasting stuff, but we drank it anyway."

Atarah laughed. She knew exactly who it was. It had to be Mies. He worked with his father in the organic chemistry labs. He was always synthesizing something, all of it against the rules, particularly for the teens.

"We passed it around. I think Mies said it was about 150 proof ethyl alcohol. It burned my throat, I know. It wasn't long until we were laughing and singing songs, and the boys were doing acrobatic tricks. For one, they hoisted Camber up on top of a pyramid of boys. She stood on the very top of them, standing on just one foot, balancing herself and touching the ceiling. There must have been five or six layers of boys all stacked up standing on each other's shoulders. Someone wobbled, and they all fell in a slow-motion crash... She ended up on top of me."

Atarah's eyes lit, and she smiled.

"Camber laughed, then we looked at each other, and she just kissed me. Right on the lips. She was completely on top of me. Her arms went around mine, and we kissed."

Abra had Atarah's attention now, "French?"

Abra giggled, "Well, the others seemed busy, too. And a few started to wander away. It was pretty late. But Camber and I..."

"Oh, wow! Hot! See, you guys hit it off without even knowing."

Abra thought about Camber and then about her mom.

She began to cry, tears flowing down her cheeks, "I miss her! I miss my mom! So badly!"

Atarah wrapped herself around Abra and held her, slowly rocking. They held tight to each other as Abra cried herself to sleep that night.



Atarah remembered vividly the day she thought she had lost Jabin forever. Jabin was up at the orbital construction site of the Cecilia Payne with his dad. The site, located at the L4 Lagrange point, was simply called “Station”, though the real name was Valya Station or Valentina Tereshkova Station after the first woman to travel into space.

Jabin had just sent a message to Atarah, saying that their work was nearing completion. They were testing the plasma engines one-by-one. Fourteen-year-old Atarah had gone with her mom to the NearSide telescope to assist with re-instrumentation. They were in a lunar rover just pulling up at the observatory when a bright blue-white light lit the sky. The light faded slowly into an expanding red ball.

“Mom, look!” she cried out, “What’s that?”

“Oh, God!” her mother replied.

Naarah knew right away what it was, but so did Atarah.

“An atomic!” she was getting frantic.

Her mom finished docking to the airlock, with Atarah hurrying through the lock into the station as quickly as she could. She headed straight for the control room where the communications equipment was. She bounded through the tunnel using her hands to push off the ceiling and walls as she leaped too hard in the lunar gravity.

When Naarah had finished with the rover and reached the underground control room, the comms were alive with traffic. Atarah had pulled up the data holo displays and was trying to open a video channel to Valya Station and Jabin. She switched to using just text messaging after several failed attempts at getting a video channel.

Naarah looked at the other communications happening as Atarah kept frantically sending messages to Jabin with no reply. Tears ran down Atarah’s face as Naarah held her daughter.

“Mom... I can’t raise him...” her voice cracked with stress.

“Hold on, Atarah. The data news shows that a Blue Ion test site was involved, not the Station.”

Atarah held her breath as she looked at the reports her mother was showing her. Naarah looked at one of the newest reports; Blue Ion had been testing an antimatter engine that quite obviously did not go as planned. She found that the test site was not at the Station but was not terribly far away either.

Atarah saw the report, “The gamma...” her voice cracked.

She knew that a matter-antimatter explosion generated significant radiation, including hard gamma rays. Too much could be quite lethal. Naarah immediately began swinging the smaller asteroid search telescope towards the L4 location.

Atarah's eyes were flitting back and forth between the telescopic display and the data feeds. Voice and video traffic had saturated the available bandwidth, so she hoped for a text-only message. Atarah saw a report that at least two Blue Ion engineers had died. The news feeds were still focused on the engine test site and barely mentioned the Station.

The telescope finished slewing and focusing in on Valya Station. The Cecilia Payne was there, quietly floating in space. They could see no activity, but image resolution down to a human or droid size object was not possible at this distance. At least this confirmed that the ship was intact and not involved.

Atarah's eyes were too full of tears to see the text message arrive. Naarah saw it first.

"They're safe!"

Atarah wiped her eyes yet again as she read the message. It was not heavy on details other than that by luck, Jabin and his father had been in the shielded Drive pod, and the ship had happened to be facing Shield first toward the blast.

Eventually, engineers discovered that the antimatter engine had an utterly unpredictable containment breach, which caused the explosion. Two workers were killed, and several more had to be sent back to Earth for radiation treatments. It destroyed a dozen droids, and several electronics modules on the construction bays surrounding the Cecilia were damaged.

The ship had survived; Pilot had isolated the damaged devices, mainly imagers and external electronics. Jabin said there were several debris impacts on the Shield, but nothing significant. Their radiation exposure was high but not serious.

SpaceTrack determined that the matter-antimatter annihilation of just one gram had vaporized nearly the entire test platform, leaving only a small amount of debris hurtling away as dangerous 'space junk'. The lunar geophysical station noted that there were three detectable impacts onto the Moon, none causing damage.

However, none of this was of interest to Atarah. Her focus was entirely on waiting at Armstrong City's landing station for her Jabin to return. And of course, she completely embarrassed him in front of their parents and all the others waiting nearby by leaping into his arms and wrapping her arms and legs around him, nearly knocking him over. Her kisses did not stop until he had carried her from the terminal into the tunnel connecting to the City proper.

She would not even leave him that night, staying over with Jabin at his parent's apartment, though they required Jabin to sleep out in the main room while she took his room. They knew Atarah was too emotional to allow the two of them to sleep

together before their upcoming mating day. As it was, Jabin had to sit on the floor beside her until her eyes became too heavy with sleep and closed.

He watched her face soften, and breath deepened. He knew they would soon be mated for life.



Atarah remembered her mom taking her down to Nursery in the middle of the night once.

“Atarah, get up, honey, quickly!”

“Mommy, what is going on? Why do I need to get up? I’m sleepy. Where are we going?”

“Sweetheart, here, put on your coat. We need to leave now! We have to go to Nursery.”

Naarah picked up Atarah and her coat and hurriedly left their apartment, almost in a run. Seth was just outside, helping others as they passed by.

“Naarah, hurry! The impact is predicted in less than four minutes. We need to leave NOW.”

The three of them hurried down the sloping tunnel, skipping the lift. Others headed in the same direction.

“Daddy! What’s happening? Why are we going to Nursery?”

“Honey, there is an impact warning issued. You remember going through the drill, don’t you?”

“Daddy, yes. But that wasn’t in the middle of the night. Is this not a drill? Are we going to be hit?”

Without an atmosphere, the Moon is susceptible to direct impacts from asteroids, comet debris, and even errant space junk. On Earth, dozens, if not hundreds of these items, larger than a golf ball, streak in at tens of thousands of kilometers per hour every single day, only to burn up in the atmosphere.

On the Moon, these impact the surface, adding its crater to the ancient ones. Scattered over the entire surface, they are rare and unlikely to cause any damage, but like Earth’s earthquakes, they can happen with little warning. Thus in orbit is a tracking system, providing a few minutes early warning of such events.

SpaceTrack had detected a piece of composite material the size of a brick from a spent booster component from nearly a half-century ago that was on an orbital path expected to collide within a few kilometers of the City. Being black and non-metallic, it had escaped detection until only minutes from impact. ARMIE issued the warning as a precaution as the track still had a significant margin of error.

Atarah and her parents made their way to Nursery, where several other parents and children were already.

“Atarah, no honey. It’s unlikely to hit anywhere near us, but we needed to be in a safety area, just in case.”

“Can we see it hit?”

Atarah was more excited about the explosion and cratering that might happen than being frightened.

“Silly girl. Well, I am sure SpaceTrack and ARMIE are watching.”

“I want to watch, too. Can you bring up a vid?”

Naarah looked at Seth as they tried to figure out how to contain Atarah’s curiosity without affecting the situation, in case it did actually strike the City.

“It probably has already impacted. We can watch the vid in the morning when you get up.”

Atarah looked up at her father, disappointed, particularly that if it had already hit, they saw and felt nothing.

Seth checked the feeds and found that it actually had impacted just a few moments earlier, about five kilometers from the edge of the City. The live views still showed some fine dust settling. The replay showed a bright flash and debris flying above the surface. It looked like not much of a crater, mostly scattered lunar dust for many meters around the impact. Had it hit the dome, it likely would have caused significant damage and could have caused a breach, evacuating the atmosphere for areas not sealed off.

However, for Atarah, it was a non-event, other than the rude awakening and rush to Nursery in the middle of sleep time.

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Repairs to the Cecilia Payne were of little consequence. However, the antimatter engine test failure would affect Blue Ion for years to come. They moved their entire operation to an L5 Lagrange location at great expense and some consternation to a few long-duration scientific satellites near that region, quelled only slightly as Blue Ion paid out significant insurance payments for any impacts to those missions.

Memorials were held at the Blue Ion headquarters on both the Moon and Earth for the two that perished in the fireball.

Engineers performed extra testing on the Cecilia, but the technology used was not the same, being standard fusion/plasma instead of pure antimatter/matter propulsion.

The scientists and engineers working on the antimatter engine eventually discovered the complex set of circumstances that led to the failure and began the long process of rebuilding and retesting.

Nevertheless, Atarah was glad that Jabin had to finish School at Armstrong and not go back to the Cecilia until they both were to leave in a year and a half's time. More importantly, their mating day was rapidly approaching, only days away now.



Jabin was nervous about his upcoming Mating with Atarah. When they had been, well, spontaneous with the times in the hydroponics garden and in the hamster ball, among others, it all seemed so simple. He loved Atarah. She loved him. He wanted to make love to her.

Now, things seemed... complicated.

"Mom, I, ah, I need to talk to you."

This was really hard for him. He needed to talk about things that just did not seem right to speak to parents about. School had given him the mechanics, but not the intimate details of lovemaking. How are boys (or girls) supposed to know how to act on their Mating night? He questioned his abilities for the first time.

"Jabin, what is it, son?"

He fidgeted, "Mom, I, uh, Atarah, uh... Mating... Party?"

Caare now knew the issue. This was the big moment. Life-changing. She sat Jabin down, held him in her arms, and quietly talked about when she and his father were first Mated. How nervous the two of them were. How unsure of themselves. How they handled it, just by taking it one day at a time. One hour at a time. One minute at a time.

"Don't worry about other people. Don't worry about the future. Things don't need to go perfect. They won't go perfect."

"Your father was so shy. I had to hold his hands and guide him each step of the way. The party, the rituals... the night."

Caare and Jabin talked late into the evening about expectations, about confidence, about love, about living life with another, and about lovemaking.



One of Atarah's best-loved things to do was to listen to her favorite singers and music groups. She would lie on her bed and, using her BCI, be front stage with her idols. If she wished, she could even be on stage 'performing' with them, and it all seemed utterly real. She mused that she had never actually seen any of them in real life until her favorite singer arrived one day from Earth on a lunar vacation.

Atarah was indeed 'starstruck' over being able to see Arial in person. Atarah was even invited to help with showing their group around the City. Atarah was so surprised to discover that Arial was so friendly and... well, normal.

Arial was just a couple of years older than Atarah. The two teens discovered they had much in common, even if being from different worlds. Of course, Atarah took several holos with Arial. More importantly to Atarah, was that they sat and talked together on the rover ride out to the Apollo 11 Memorial. Arial described her feelings of rising from a typical teen, much like Atarah, to a famous celebrity and singer with millions of fans over just the last few years. She realized fame could come in ways you would never expect. And it could come very quickly. Atarah treasured that meeting for the rest of her life.

Jabin, on the other hand, rarely listened to music, instead loved to peruse old movies. He always got a kick out of ancient horror and space movies. He preferred the old vid versions and not the BCI remakes, even though the remakes were incredibly realistic, making the viewer feel like they were a part of the action, even playing different characters in the production with the scenes being created in real-time. You could BE the characters. But to him, seeing the old style two-dimension 'films' projected in front of him was vastly preferable.

Atarah would sometimes join him, lying together on his bed watching the funny old space war movies. Some of them still surprisingly entertaining, even if over a century old.

Jabin's mom had discovered an old-style treat called 'popcorn' that the kids would eat while watching the vids. Atarah did not mind Jabin's strange oldie movie interest as long as she could be with him.



At their Mating Party night, Jabin pulled on the left tear point of Atarah's thin remaining clothing covering her hip. It separated, again like tissue paper.

He pulled it away representing giving herself to him. Other teens had snickered when told about this part, while he felt it an honor that a girl would do this.

Atarah smiled at him, her eyes sparkling, dreamy. She had hugged her mom, who had told her how proud she was of her daughter, now growing up to be an intelligent and caring young woman. Jabin's mom had kidded the two teens with teasings.

"Okay, young man, you take care of her, and Atarah, you keep him in his place!"

"Hey, I thought SHE was supposed to take care of ME!" Jabin laughed.

Atarah pulled him to her, "No buster. Us women run this show, my darling!"

Nevertheless, now it was Jabin who was doing the advancing as she lay quietly, tense with anticipation.

Tonight would be their first physical lovemaking. No BCI allowed.

However, he remembered when he discovered how to turn on full access on his, and her, BCI.



Every night, Atarah would receive and accept Jabin's request in her head as she lay in bed. They would lie dreamlike linked together in their thoughts, though physically separated, as they drifted off to sleep. Connected at the lowest level of emotional BCI settings.

However, this time it was different. Strong. Feelings rushed in. Powerful. High-level BCI access. This was as strong as School lessons. Stronger... raw emotions. She felt love, desire, breathing. She panicked at first but felt him soothe her. She sensed something else, desire. Desire for her. Her slow breaths increased to near panting. He was doing something. She touched her body in response, and she felt him react. They spoke no words. They were sharing their uninhibited physical and emotional desires.

Their feelings echoed back and forth between the two youths mixing together as one. She felt his need. Her brain seethed with sensual energy coming from her body and from his mind. They were as one, connected without touching each other.

Their bodies and thoughts erupted, echoing like bells in a cathedral.

Their desires temporarily sated, both now sleepy even as her head ached from the powerful neural linking.

A week went by since that virtual encounter. School lessons became more complex and separated her from him. Atomic physics and quantum mechanics were hard.

The lessons, fed at high-speed by BCI, still gave her migraines. Her mother comforted her and gave her medicines both physical and virtual, light calming emotions, just at the lowest level of sensation. Like a massage of hand and stone and smell.

She never told her mother about the full open channel she had with Jabin. It, too, had given her a migraine that she had to tough through on her own.

Then came the hit.

Jabin had discovered something else available on full access connections. Atarah felt a connect request from Jabin. She accepted, and her mind exploded in raw sex. He had tapped into a hardcore porn mem recording. Her eyes shut tight as waves of mental lust burned her brain. Her mind inundated as amplified uninhibited adult sex poured into her 13-year-old brain.

She screamed.

When she woke, she was in the clinic, her mom beside her. The doctors had figured out what had happened. They gave her a memory attenuator and an IV sedative, as the hardcore memories were suppressed to just vague murmurs. Jabin had also suffered the emotional hit and had undergone memory attenuators as well.

The two of them received stern warnings about the dangers of addiction to drug and porn BCI mem recordings.

After the doctors sent her home, she pleaded with her mom that it was a mistake and not to punish Jabin. He just did not realize it. Jabin's mom had cyber support update the security protections, closing the loophole and locking Jabin's BCI to only work with School. Atarah's BCI was also tightly locked down.

The two teens were forbidden to see or communicate for a month. It was the hardest month in Atarah's life.



In their Mating bed, Jabin saw Atarah's body for real for the first time, uncovered, unveiled. She smiled at him, but her eyelids were so heavy. The bed was so soft. She had been awake all night with nervous energy. Here they were, finally, after nearly two years. They could make love physically. They were about to make love. He sat on his knees just looking at her body, now completely exposed to him. He was supposed to undress similarly at the tear strips on his clothes as she watched, but she had closed her eyes. Her face softened. Her breathing calmed.

She was fast asleep on their mating night.

He smiled and lay down beside her and covered both of them with a blanket.



Late one night, thirteen-year-old Atarah was lying on top of a storage building that reached to just below the roof of the dome, one of her favorite spots. She would lie there staring out through the transparent city dome, wondering about the vastness of space above her. Even after several centuries, humanity had yet to find definitive proof of intelligence on other worlds. As her Teacher suggested, 'Space is really, really big and we are really, really small.'

Though she and most others did not doubt that it was out there, it was just hard to find. Particularly, since life, microbial life, that is, had been found on Mars and Europa. Even several other moons had all the building blocks but just not explored thoroughly.

After yet another lesson on quantum mechanics earlier that day, with its mathematics that always gave her a headache afterward, she had learned about multiverse theories. Many now becoming a core part of astrophysics in the quantum realm. She lay there on the roof, wondering if another Atarah was also lying in some other universe, staring up and thinking similarly.

Suddenly, a flash appeared off in her peripheral vision, like a firefly in the distance. Then a barely audible booming sound filtered across the dome, like the

sound of a fingertip that lightly tapped a kettledrum. A micrometeorite, probably no bigger than a grain of sand, had impacted the dome and flashed into heat and light. No danger to them inside the dome and very rare, it excited her, this being her first ever to observe directly.

Atarah's thoughts turned to that little dust grain. Probably from a comet that had passed the orbits of the Earth and Moon millennia ago. Before that, it had ridden endlessly as a part of that comet since the birth of the Solar System. Only to collide with her lying here, billions of years later. Flashing into atoms as it impacted. Gone. She felt herself adrift in the universe. Waiting for her own collision?



Teens all roamed the halls and streets of Armstrong City at night. Even after being Mated, Atarah did so, sometimes with Jabin, but many times alone. She liked the freedom. They still lived at home with their parents and would continue to do so until they both finished School and made their way in life, usually around age 18 or 19.

This night, Atarah wandered into the Earther district, the place where most of the rotational workers lived. It consisted of tiny apartment blocks with equipment and engineering areas nearby. It also included a cafeteria and storefront shop with replication printers and a single café/bar; Moons Milk Bar.

She had never actually been inside Moons, but tonight ended up sitting across the street from it, just people watching. Music blared from the open door. Like any transient town, there were all types of characters coming and going, men and women, mostly Earthers, from cultures all over the planet. They would bunny hop into Moons while others wobbled and bounced on their way out.

Atarah would laugh at the newbies trying to learn how to walk in the one-sixth gravity and at the gruff-looking old-timers with their, probably purposefully, gray moon dust grimy jumpsuits. The gruff women the same as the men. Most never actually mined or even got dirty. Instead, they ran droids and heavy equipment from the comfort of a control booth. But looks were important. And Moons was for looks.

As with any rough and tumble bar, there were girls (and guys) looking for a mark to squeeze a few credits from for a good time. Ironically, most of these were far from full-time erotic workers. Instead, they were likely to be researchers, administrators, engineers, even scientists. All putting on alter ego personas at night and role-playing. And a few extra credits never hurt. The local security paid little attention as long as nobody's head got busted.

Atarah had just stood up and was about to leave when a 'boytoy' hopped right in front of her. A young man in his twenties, obviously into gymnastics by his slick arrival in just one hop, which ended perfectly, almost nose-to-nose.

He was dressed in the exotic skintight outfits that the 'evening lads and lasses' wore. His was jet black, blacker than his skin, thin and tight enough to show every muscle and bulge. His face was made up with enough style and flair to make it near impossible to recognize him in the day, again typical for the sensuous cosplayers of the night.

He took Atarah's hand, squeezed it tightly, smiled, and motioned to come with him. He was not going to let this pretty one sneak away so easily, at least not without a little fun play. He led her inside Moons, where the music competed with the cacophony of voices, laughter, and singing going on inside.

He sat her at the bar and took the seat beside her. A young woman, also in her twenties and obviously a 'girltoy', was to Atarah's left. The woman wore a skin-tight outfit colored in a rainbow of pastels that looked more like paint than clothing. It showed every detail of her body.

She leaned over, "Hi, little one! My name is Trish. And this..." pointing to the young man who had brought Atarah here, "...this is Joe."

Atarah giggled over the obvious nom de plumes, "Hello, Joe. What do you know?" she laughed at remembering an old movie line.

Atarah started to introduce herself, "I'm Ata..."

Trish put a finger up to Atarah's mouth, "Hi, Ata. No real names here. I like Ata!"

Joe had signaled the bar droid, which placed bulbs of something in front of each of them. Atarah tasted it and coughed once. An intoxicant, more potent than typically served, and likely mixed with various chemicals to enhance the effects, as well as eliminate the aftereffects. No hangovers here.

She sucked on the bulb, already feeling its impact as the droid offered up its paypad to her. She touched her fingertip to it, only slightly wondering how many credits just flowed out of her account as Joe and Trish each took turns talking to her and playing with her hands and legs. Joe had dropped Atarah's hand into his lap, wasting no time to offer his services.

Trish was not letting Joe take all the fun and was nibbling at Atarah's earlobe between sips of her drink. She turned Atarah's head towards her and kissed her squarely on the mouth. Atarah's eyes widened when she felt a mouthful of Trish's drink flow into her mouth. Different and even stronger, with an ecstasy-like chemical included. Atarah, now Ata, felt the room spin a bit. She was not used to this level of drugs, though she knew that the effects would be short-lived.

The drug affected her immediately. Ata began almost instinctively to cuddle against Joe in his silky smooth skinsuit. Her heart rate increased and face flushed. The intoxicants amplified the euphoria of passion and desire for intimacy. She felt loved by Joe, even though just meeting him. She loved everyone around her now as the e-drug peaked. She wanted to hug them all, like a little butterfly flitting from flower to flower.

With Trish also so close, Ata was drawn back and forth between them, trading affection with them both. Ata felt another surge of yearning well up from inside her, driven by the e-drug and her own bulb's liquid chemicals. The three paused their endeavors, only to take another sip of their drinks and let the next wave hit.

Ata looked down at her now almost empty bulb drink when the bar droid dropped another to her and Trish, pointing towards a man farther down the bar. Trish made Ata finish her first and then start the second before she got up, carrying Ata along arm-in-arm, over to meet the man. Ata looked at Joe, who just smiled and shrugged, letting Trish haul away his newfound friend.

Like most of the Earthers here, the man's head and face were clean-shaven to mimic the locals' baldness. Though a day old growth of beard was starting to appear, giving him an older, more rugged look than the early forties that he was.

Trish introduced them, "Ah, my friend, Mr. Ed! This is my newbie Moonie, Ata."

Mr. Ed, another obvious alias, replied, "Trish, my love! You are looking rich tonight. I might make you a little richer later if you like. And oh my, Trish, what a lovely little Ata you have found!"

Ata replied, giggling and smiling, "Mr... Ed! Ha! Glaadd. Meeett you...", stumbling over her words.

"Call me just Ed," he replied with a chuckle, "Trish, you have to cut this little one off, it appears."

Trish laughed as she held Ata up from falling over, who was now feeling very warm again and wanted to snuggle. Ata wrapped her arms around Trish and cuddled into her.

"And... Ed, this one's not for you. She's mated and too young. But she's welcome to watch and play a bit."

Trish leaned over and kissed Ed deeply, again pushing a mouthful of drink into his. Her trademark. He was happy to oblige, feeling the rush of the e-drug as well.

Ata pulled tighter against Trish as both luxuriated in their bodies' warmth and sexiness mixed with the chemicals. When Trish finally pulled away, Ata instantly turned and hugged Ed, cuddling with him.

She wanted his arms around her as the e-drug made her want to love him. Ed obliged in returning her affections, his mind also responding to the e-drug. She was small in his arms, being a half a meter shorter and half his weight. Ata felt the rough scratch of his stubble against her face, an unknown feeling, along with his much larger frame.

She felt she was... with her father! Her father, who she now missed more than ever. She yearned to be in her father's arms. To be cuddled by him. Held by him.

Ata felt so warm and so loved by her surrogate Ed/father that she unconsciously began to rock just as her father would do when she was sad or felt bad. Trish gently

separated the two, giving Ed a look of, 'no-no, not for you.' Ata started crying, her separation from Ed magnifying her feeling of separation from her father.

The e-drug started its decline, making her want more of it, even though it was purely a psychological desire and not a physical one. But to Atarah, now Ata, she felt instantly abandoned and unloved.

Trish could sense the shift in Ata and urged her to take a sip of her drink to take the edge off the e-drug cascade. She decided she would take her to her place instead and let Ata calm there.

"Sorry, Ed. Next time", she smiled at him and took Ata with her as Ed shrugged and blew the two of them a kiss.

Trish's apartment was just a hundred meters from Moons. She sat Ata on the bed and went to get the two of them a ClearPill and some water. When she got back, Ata was curled up around a pillow, tears still in her eyes and falling asleep. Trish almost wanted to let Ata sleep but knew it was likely she had snuck out of her parent's place and would be missed very soon.

"Ata, honey, you need to take this," as Trish handed her a pill and water and then took one of the remedies herself as well.

"And I need to get you back to your home. I'd let you stay, but your mom would likely get very worried."

Trish, whose real name was Kiska, had recognized Atarah from the beginning. She had even attended Atarah's Mating Party. It wasn't unusual, even encouraged, to 'sow the oats' as an unofficial after-mating ritual. But when Atarah had started to spin under the drugs and excitement there at Moons, she had decided that it would be best for Atarah to wait.

By the time Kiska had Atarah back at her home, Atarah was clear of all the intoxicants and felt a little sheepish.

"Atarah, you are so sweet... come back in a couple of years, and we will have some real fun!" She kidded.



The hundred meter long Cecilia Payne slid silently through the endless night of Space. Moving now at nearly one hundred kilometers per second and adding more velocity by the minute, the Drive pushed them towards their goal of the asteroid 2 Pallas and Atarah's father. Though, its movement would have been barely perceptible among the stars.

Onboard the Cecilia Payne, Jabin leaned back against the bulkhead as Atarah released herself from his embrace. Suddenly, without any warning, their world turned MAD! Collision alarms broke the quiet. The two were tossed into the air, now filled with debris.

“ALERT! ALERT! LOSS OF PRESSURE IMMINENT!” repeated over the comms.

Atarah, still hanging onto the handrail, watched uncomprehending as small, red globules floating away from her body in a steady stream,. Their meaning unfathomable to her. The world was muted to her overloaded mind.

She looked over at Jabin.

His face showed complete surprise, shock. He floated away from her, colliding and rebounding off one wall. His head moved, but arms and legs stayed still, unmoving. He was yelling something. Something at her.

Noise, screams, dozens of high-pitched screams came to her as her head cleared. The pain came too. Blood was streaming out and floating away from the both of them. Flotsam and jetsam was flying everywhere. Anything loose seemed to be in the air.

They were weightless. The Drive was offline. Pilot was sending them a storm of emergency messages but already prioritizing the most critical and attempting repairs.

“Air... Leaks!”

She finally heard Jabin. Without thinking, she immediately pushed away from the wall, releasing her grip on the handrail, wincing in pain as she did.

Pilot reported that it could not stop all the leaks. Air pressure would be dangerously low in less than one minute.

She hit the other wall with her shoulder, fighting the stabbing pain, kicked again, and grabbed the emergency pack yanking out its O2 mask. She took a breath from it as she strapped it to her face.

She looked at Jabin. Why wasn't he moving? She saw more globules from him. She grabbed the other mask and kicked towards him. More pain. Overwhelming. She fought to keep from blacking out.

She used her BCI to override her agony, using a feedback of emotion inversion. An explosion of pleasure crashed through her brain as the pain inverted, before immediately dialing back the intensity to counter the pain. Breathing deeply, her mind was still blurred and in shock. She let her training take over.

Atarah reached Jabin and pushed the mask towards him. He did not move but looked at her and called out.

“HELP!” he whimpered, staring at her.

She pressed the mask onto him and tightened the strap. He nodded his head. She grabbed him, still unable to understand why he was not moving. The high pitch noises flooding around them were decreasing. Air thinning. Still in danger. Blood would boil.

Atarah grabbed his limp arm and pulled him into the emergency cubicle with her. Slapping the red trigger button, forcing the door to shut. The cubicle flooded with atmosphere.

Pilot said that there was now a hard vacuum on the other side of the cubicle door. Repair droids already dispatched to attempt to locate and plug the leaks.

Atarah ignored the data that Pilot was giving her. She was busy with the first aid kit trying to stem blood loss on Jabin and herself. She took their masks off.

“Atarah, I’m paralyzed!”

She was already pressing WoundHeal onto both of them and almost simultaneously injecting them with pain blockers. She was also fighting to keep the BCI inversion feedback stable as her emotions shifted back and forth between pain and pleasure. She fought back the desire to scream.

Finally, “Jabin!” she cried.

Atarah was at a loss for words. She touched his face and then completed bandaging both of them. She found a hole through her thigh. Another through her shoulder, and felt one at the tip of her ear. Her leg, arm, and the side of her head all covered in blood. Droplets still floated around them. Another few centimeters, and it would have been through her head.

Atarah also realized just how close she had come to losing Jabin. She knew she was still in shock even as Jabin held himself together for her. They had linked BCI at a low level, just to feel each other’s presence in their mind as their situation started to sink in.

She looked over Jabin’s body through eyes that looked like she was underwater. Tears had collected over her eyes, where gravity would have pulled them down her cheeks. As she wiped them away, he told her he could not feel anything below his neck. There was a nasty cut right across the back of his neck, almost at the shoulder blades. It had cut part of his spinal cord. A millimeter or two more and he would have been dead. All of their wounds were surgically precise as if bored by an Auto-Doc. But any one of them could have been fatal. Only pure luck kept it from being true. Their clothes were covered in blood splatters. Both ashen, they looked dead.

Tears again formed again in her eyes as she described the details of their wounds to him.

Jabin spoke again, “Well, shit. That was interesting.”

She cracked up laughing, partially from the pain blockers and the roller-coaster BCI ride previously. She still held onto him with both hands, her toes wrapped to a foothold, afraid to let go of him for fear he might die and leave her alone to face what happened.

She sucked in a breath, “Pilot, report.”

Pilot fed her data over her BCI. There were dozens of alarms, categorized by criticality.

Jabin tapped the feed via his BCI. She felt him thank her and smile at her, even if only to put forth a brave front.

Some of the alarms were disappearing as self-healing and redundant systems came online. The two remaining droids were busy patching things. A third one destroyed by whatever hit them.

Pilot postulated that a swarm of unknown particles had holed them. She thought that was incredibly unlikely since the particle's angle was not against the Shield but was to their side. Additionally, the particles should have disintegrated on impact with their meteorite shields. Whatever they were, they were incredibly tough. They had gone through them as well as the ship like butter.

Pilot also reported that two of his CPs were down. They were now running on a single AI central processor. If that one failed? She almost felt a shrug from Pilot on that note.

"Well, Jabin..." she started.

She leaned over and tried to kiss him but just bumped heads as she bottled up her emotions of fear and loss.

"...I think we need to get down to Auto-Doc," she finished. He laughed.

She searched for its status from Pilot's list.

"Shit."

"Yes."

He acted bravely but knew that Auto-Doc was offline already. She applied a neck brace to his head as they floated in the tight space.

"Atarah, I think first we need to get out of here. And could you give me a bit more of that pain med?"

She almost laughed but gave both of them another hit. She then immediately started querying Pilot for Living Pod repairs. Its response was not good. Locating the remaining holes would be nearly impossible, now that the atmosphere had vented.

"Ok, what do we have in gas form that we can live without," Atarah pondered.

By releasing gases into the Living Pod, she knew the droids could detect the leaking holes. They thought as Pilot when through a list of gasses on board. O2, CO2, N2... Then went to items that would flash to vapor in a vacuum; water, urine, various coolants...

She hesitated to use atmospheric gases. They needed those to breathe! And forget using water.

She pondered, "We need something like smoke."

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Nine-year-old Jabin was tasked to build and present a project at their School's science fair. Most kids created virtual reality simulations, typically similar to the jobs their parents did. However, Jabin decided on something different, at least to

their little world. He wanted to build a volcano model, a working volcano with smoke and all.

Volcano models were a mainstay of science fairs all around the Earth for centuries. But on the Moon, considering there were no volcanos, this was rare, very rare. There was one other reason they were not seen, and that was Fire. With a capital 'F'. On Earth, most science fair volcanos had shifted to using baking soda and vinegar mixed with red food coloring. Jabin was having none of that.

Fire anywhere in Space is considered the worst disaster possible. A tight, closed environment with nowhere to run, to get away from oxygen-consuming flames and its dangerous gasses. Thus, fire detection and control systems were sophisticated and ubiquitous.

But surprisingly, School had no specific prohibition on volcanos with real fire. Mainly because it was so taken for granted that fire was such a big NO-NO that no one would have even thought to do that. Another factor was that no one had ever built an actual physical model of a volcano for the Armstrong Science Fair. Actually, physical models of anything were rare. Usually, only if the project involved a new food item or cloth or similar "touchy-feely" idea. Everything else was a simulation.

Jabin modeled his volcano, nearly a half meter tall, from plaster made of lunar regolith and excess plant material that was much like a paste. However, his real secret ingredient was something he had learned in organic chemistry, simply blend powdered sugar with carbon and a little sulfur. He made small slugs of the substance mixed with water. He baked the black blobs like cookie drops to dry them, then piled them into his volcano. To test, he lit just one with a small torch in a lab. The little cube smoked and burned, and snaked black ash... even smelled like a volcano. Perfect. One cube.

He loaded several dozen into his volcano, rigged a burner inside to ignite them, and then finished his display vid and holo panels.

On the day of the science fair, dozens of people were in the hall with all types of advanced holo simulations of telescopes, satellites, biological experiments, and more. Parents, researchers, and the curious attended.

Jabin unveiled his model, his large physical model, well detailed, even with tiny trees around its base. He described it to all that came by and got many praises for so unique a project. At least, until he was ready to demonstrate it.

People gathered around, and they dimmed the lights. Most expected a holo simulation...

He lit the torch. At first, nothing happened. Then, with a massive burst, vast clouds of dark gray smoke billowed forth. Globes of ash started flowing up and out of the volcano. Suddenly, colossal flaming sparks and fire erupted, reaching a meter into the air. Shouts and screams also erupted from the crowd as the flames burst

forth. People pushed backward away from the inferno. Now the entire volcano was starting to burn!

ARMIE AI sounded the fire alert and flooded the area with fire suppression gases and foam covering Jabin and the remaining audience as they tried to retreat.

The fire was quickly put out, and needless to say, Jabin, as well as all others, were never allowed to build another project that used heat or flames.

It was a long time before Jabin had lived down that embarrassment. Even at his and Atarah's Mating Party, five years later, there were a few whispered comments, "Isn't he the one that tried to burn down the science fair that year?"



As Atarah went through the possible gasses with Pilot, Jabin replied, almost quietly, "The fire suppression system."

Atarah squealed, hugging him. A young teen again for a moment. That was perfect. They could trigger it in each compartment one at a time as the droids scanned for leaks.

She had long forgotten Jabin's volcano misadventure. But then the realization hit her that he could not hug her back. That scared her more than anything in their past. She had to push that thought away for the moment and not panic as another vital question came to her.

"Pilot, how much time do we have left in this emergency cubicle before we pass out?"

"At current consumption, approximately fourteen hours and thirty minutes."

That was faster than expected. It was supposed to last twenty-four hours.

She whispered, "Shit, of course, two of us, thus about half the time."

Jabin replied, "Well, there's the other cubical on the opposite side. I'll just mosey over there, ok?"

She did not like his joking now. She got to work with Pilot on using the fire suppression one section at a time through the entire complex of Cecilia with a droid detecting and patching leaks.

Slow work, hours went by, pain meds repeatedly administered. Jabin could only watch with eyes and BCI, offer suggestions, and look into the other compromised systems.

Diagnostics showed dozens of uncorrectable issues. He did not tell Atarah about the Drive yet. It was bad. The fusion drive had been SCRAMed. That was more than bad. No more Drive. He moved on. Push Death away, first by seconds, then minutes, then hours, then...



In their Mating bed, Atarah woke and rolled over to find Jabin asleep beside her. She started laughing. All this time, the buildup, the Mating Party, and what do they do on their Mating Night? Sleep! She kissed him. He opened his eyes.

“Hi, my love. I guess you didn’t do me while I slept?” she kidded.

He blushed. His clothes were still on. Hers crumpled underneath her. He rolled over on top of her and kissed her.

She asked, “May I?” as she found the tear strips on his mating clothes and ripped their seam without waiting for his reply. His clothes came away as easily as hers, including his underwear. She wrapped her arms around his now bare chest as he kissed and nibbled on her. She giggled to his touches and moved her hands down to his hairless butt, clutching each cheek.

“You don’t want to wait, do you?” he kidded.

“I’ve dreamed about this for a year,” she replied with a sultry tone.

“I hope I live up to your dreams.”

Luckily, their memory attenuators had reduced most of their previous virtual encounters and that explosive porn mem to just a distant glow. So, Atarah would be experiencing her first real lovemaking.

Assuming if he ever got on with it.

She squeezed his butt cheeks again and spread her legs wide for him.

“Too quick, my love. We need to build,” he whispered.

She stopped, “Wait! HOW do YOU know how to build... my LOVE?”

“Hey, I’m 14. I have my ways.”

She swatted him. They tumbled and wrapped themselves in their covers. She ended up on top.

Atarah pushed the blanket off her.

“Hot,” she whispered, fanning herself as she sat up, straddling him.

“Yes, you ARE!” he kidded.

Jabin ran his hands from her waist up her body. He traced little circles around her nipples then pinched them.

“Ow.”

He pinched them harder. Her eyes flared, and she collapsed onto him. Her 6 kilos lunar weight was a mere feather on him. He felt her long toes tickle his feet as her hands stroked his sides. They kissed.

Atarah pushed her tongue against his lips. Jabin opened his mouth to accept her. School had not described French kissing, but they had figured it out quickly over a year ago.

She remembered that time under the hydro garden where they were so frisky. But this seemed different. Almost like they were a long-married couple. Just gentle touching, holding, being close. Their teen burn seemed almost subdued this morning.

She lay down on his chest and listened to his heart, now beating fast.

Then they began their first lovemaking...

Afterwards, they slept. Then they made love again.



Twelve hours had passed. The last of the holes in Cecalias' pods were patched. Pilot was restoring the atmosphere as Atarah slept, exhausted, and overloaded with stress and pain meds.

She had buckled Jabin to the cubicle wall, and she floated beside him. He, too, was asleep. Knocked out by the meds and BCI feedback as they awaited repairs. They needed to examine the Auto-Doc and get it working. Death slowly pushed away from seconds to minutes to hours.

Pilot woke Atarah, "Atmosphere stable. You may exit the Emergency cubicle."

She had to go clean herself... and Jabin. They had had to piss into diapers that were in the cubicle's supplies. She had been sick as well, effects of the pain and stress. Luckily, she had been able to find a bag just before she threw up. That would have been gross in zero-gravity otherwise.

He felt sorry for her but kidded her to break the tension. Atarah looked mad at him but had to laugh at their sad state. She floated out, gently pulling Jabin behind her. She gritted under the pains in her leg and shoulder. Her meds were no longer effective.

Headed for the Auto-Doc, she reexamined its status via Pilot. Redundancy had restored essential functions, but there was no way it would be able to repair spinal damage. They both endured what it could provide, mainly patching their wounds and giving them better meds to fight infection and speed healing as well as control the pain.

Atarah held Jabin's head and kissed him as he lay strapped to the Auto-Doc. He urged her to go to work on the next set of issues; food, water, oxygen... consumables, and leave him to be worked on by the Auto-Doc.

The replication printer was operating, and only one water storage container was lost. There was no issue with the oxygen and regeneration systems; triple redundancy saved them. Power was running on the fuel cells. Months at least.

However, there was no nuclear fusion to run the Drive.

Normally, they would reach a midpoint where they had to shed their velocity as orbital mechanics played out its dance. Pilot would shut down the Drive, turn

around, and fire up the Drive again, ridding them of the velocity they had built up until they matched the delta-v of their destination. They were currently traveling at nearly a hundred kilometers per second and now would continue with nothing to slow them down. They would flash by the orbit of 2 Pallas with no stopping and no 2 Pallas anywhere near.

They had pushed Death away from hours to days to now months... but this last push meant nothing. They were destined to leave the Solar System... dead, once the power ran out.

"I need to radio Dad," Atarah said to no one.

She had left Jabin asleep as she worked.

"Pilot, communications status!"

She had not even thought about that. The report looked bad, really bad. The primary transmitter was toast. The secondary appeared to be repairable, assuming parts were available. Even the backup, stored offline, had a hole punched straight through it. She immediately set to work scavenging the primary and anything else for the needed parts.

Pilot was invaluable in building an inventory and categorizing the likely required components. She set a droid to work on it, as most of the equipment was external. She did not feel up to a spacewalk.

Atarah went back to Jabin and slept tied to the wall.

She dreamed.

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Her body floated in space above a planet alive with lights across its entire surface. She could see glowing nuclear fires erupting on the cities, with ships headed towards and away from the surface far below. Atomics. War.

She was standing on the inside of a great torus, many hundreds of thousands of kilometers across like an immense circular space station meant for giants. Inside, she could see seas and continents with snowcapped mountain ranges. She could see cities rising tens of kilometers into the interior sky. Bright flashes on the interior crossed the continents. Cities erupted into flames. War.

Great starships floated in battle formation. Smaller, faster ships fired invisible energy beams and projectile weapons. War.

She felt ages, eons pass. Quiet. Dead.

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Jabin awoke again as Auto-Doc inserted needles for fluids and medicines as it countered dehydration and infection.

“Atarah...” he whispered weakly.

She awoke instantly, “I’m here, my love!”

He smiled and responded, “You need to go to the lab. A droid found something.”

He had woken earlier and looked into what had hit them before passing out again under the Auto-doc’s meds.

She did not want to leave him but relented only due to curiosity. She was tired of trying to save their lives for the moment, and her dreams had disturbed her.

In the lab, the droid had placed what looked like a small shiny metal pencil on the workbench, held in place by a vise. Pilot had already run several tests. The results were on the screens, a strange ablative material on the outer surface, and a core so dense that even their x-ray spectrograph could not peer into it.

It was obviously manufactured!

It was also obviously NOT of human origin. Nothing that dense existed. Had they not been in weightlessness, it would have been difficult for even the droid to lift. Pilot had estimated its mass at nearly 100 kilos, as much as she and Jabin combined, yet hardly larger than her finger.

Atarah’s fingertip ran across its surface. It did look like an old-time pencil, with the front tip broken off and dented. The surface was perfectly clean and smooth. She thought maybe wiped of all cosmic degrading and ablation by the impact.

As her thin index finger moved along its perfection of polished machined surface, she felt she was not actually touching it.

This was a projectile. Designed to pierce thick armor. This one had only been stopped by ripping through a full water tank, several titanium layers, meteorite shields, radiation shields, and, unfortunately, their reactor core. Pilot had SCRAMed the reactor as a last-ditch effort to save them only milliseconds from containment failure.

Sadly, that SCRAM meant that their only way of restarting the fusion, assuming even possible, was ejected away from the Cecilia in the form of a grapefruit-size antimatter containment compartment. Its magnetic bubble collapsed a few dozen kilometers away. Its tiny amount of antimatter annihilated in a violent reaction as it contacted matter. Without that, they had no fusion. No fusion, no Drive. No Drive, no stopping. Death.

She remembered something about spilled milk from her mother and moved on... Projectile. War. Alien!

She broke into Jabin’s BCI with Pilot, almost screaming.

“ALIENS! WE FOUND ALIENS!”

After he calmed her down, she recounted the details. Then she remembered her dreams.

He reminded her that she only found their missiles, not real aliens. These were likely long dead, untold eons ago. Nevertheless, he did congratulate her on them being the first human casualty in an interstellar war.

She was not pleased.



Eight-year-old Atarah always liked visiting with her father in his lab. Looking around, it reminded her of the children's stories of Pinocchio and Geppetto's workshop. Tools and exciting things were all around her.

Her father had left her sitting at his worktable while he went to some meetings. She sat, looking at all the things. One item caught her attention. A small metal box about the size of a deck of playing cards. Her father had said it was a special type of oscillator, a kind of clock.

She spied that it had a loose screw. As she was about to tighten it with a driver tool, she wondered what it looked like inside. She removed the screws holding the lid and opened it but was immediately disappointed, as it was crammed with stuff she did not quite understand.

She thought maybe if the other covers were off, she could see how it worked. So she removed the screws on the remaining sides. Still, she could not see into it well enough to figure it out. So she continued removing bits and pieces until the entire thing had been disassembled and was spread neatly around the tabletop.

Only then did she realize what she had done. Poor Atarah knew she was in trouble. She struggled with what to do.

There was only one thing she could do. That was to reassemble it before her father returned. HOW? She panicked. Then realized the solution; she had seen herself disassemble it. Thus, she just had to reverse those same steps.

Not so easy, she quickly discovered. Nevertheless, determined now, she closed her eyes and visualized the very last piece, then the previous piece, and assembled those two. She repeated over and over, perspiration covered her forehead under the intense concentration of remembering each reversed step for each piece. Tears ran down her face, but she continued one step at a time.

Her father walked in as she was tightening that very last screw.

"Atarah, what are you doing? That is delicate."

She was still concentrating on reversing and was about to loosen that last screw, just as she found it. She stopped.

"It had a loose screw," is all she could muster.

"Oh, thanks. Good girl!" he patted her head.

He noticed her perspiring and felt her forehead.

"Atarah, are you sick?"

She looked up at him, forlornly, exhausted.
“I’m taking you by the Auto-Doc on the way home.”

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Onboard the Cecilia, Atarah forced herself to leave the alien artifact and return to the myriad of systems problems, slowly working one after another. Luckily, redundancy and Pilot helped push Death back until that final point. They were going to coast past the orbit of 2 Pallas at just under a hundred clicks per second, continuing right out of the Solar System with nothing to stop them.

She had to get communications up and running.

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Naarah, Atarah’s mother, sat looking at the messages and data. Blue Ion had contacted her and Jabin’s mother immediately after the anomaly.

They had lost all data communications and detected a detonation in the direction of the Cecilia Payne. Naarah forced them to turn over all of their reports and findings immediately after they had told her about it. Little of it made sense. The stream of telemetry just stopped, and then a few seconds later, it appeared her daughter and son-in-mate’s ship vanished in a nuclear fireball.

She did not accept it.

She contacted Camber’s mom, Lyka, and asked for the possible use of the ULT, the new 150-meter telescope at Farside. Lyka agreed immediately. As luck would have it, the sky where the Cecilia should be located was in the telescope’s range of motion.

Halfway around the Moon from each other, Naarah and Lyka paced as the first images began to arrive. They saw an immensely starred field. A second image came in, looking much the same as the first. The AI then removed all known objects. A few dots remained.

Naarah instinctively picked a non-descript one and requested increasing magnification. Again comparing several images over time, this one moved, moved exactly as Cecilia should. Again increased magnification, to near diffraction limits of the massive telescope’s optics. This object was rectangular with little round spheres, not an asteroid. It was the Cecilia. Later Blue Ion confirmed. They were running silent; no exhaust, no transmissions.

Naarah and Caare hugged and cried together, and Naarah thanked Lyka repeatedly.

Now they needed to know why it was adrift.

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Pilot had determined that 21 projectiles had hit them. It estimated from collision radar information that there were at least one hundred more in the swarm. They could only guess that the swarm might have been travelling in interstellar space for eons, never thinking it could be something far closer. They had no way to determine more, other than their velocity.

Pilot reported that it needed more instruments and sensors to study the projectile in the lab further. It said it found the projectile... interesting.

Sadly, Atarah had to spend all her time fixing problems and could spend little effort on the discovery of a lifetime. Pilot felt an obligation to her to do that investigative work for her as much as possible while helping with the myriad of other issues, with the most pressing now being communications.

With Pilot and a droid's help, Atarah disassembled components from the fried primary transmitter and its backup, tested and reinstalled. The primary antenna guidance mechanism was frozen. The secondary had burned out in an electrical overload but could be repaired with time.

She had Pilot use the droid's manipulators to twist and turn the dish antenna. She originally wanted to send messages to her father, but the antenna had been pointed at the Earth/Moon system at the time of failure. Since their direction had not changed, it only took minor movements to get alignment.

Atarah formulated a message and sent it to her mom and Blue Ion.

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With the SCRAM of the fusion reactor, they were doomed unless someone could magically catch their ship. The reactor generated minute amounts of antimatter, which fed back into the fusion process, keeping it going. Without an initial injection, they could never restart the reactor. That tiny bit of antimatter had been lost in a multi-kiloton explosion behind them.

They were already moving faster than necessary to escape the Solar System. They would become the first interstellar humans, dead interstellar humans when their fuel cells ran out a few months from now.

Relaying messages from the Cecilia to the Moon and then to her father on 2 Pallas, she had provided everyone with an update, including the alien artifact and poor Jabin's condition. The two teens had been flooded with happy replies as well as myriad questions about their situation. Atarah saw that there must have been a

dozen people behind their moms as their reply message was created. All of Armstrong City was now apparently aware of Atarah & Jabin's situation.

Pilot began streaming telemetry on their status. They were not in immediate danger of dying anymore, but there was no way they were going to be able to slow the Cecilia.

The closest was Seth's only vehicle, the Dragon, a deep-space tug that had hauled the two dozen people and hundreds of tons of supplies to 2 Pallas initially. It also had a fusion/plasma drive. After calculations, it would take over three months to build up the necessary velocity and months more to catch up. The Cecilia would be flying by 2 Pallas orbit, millions of clicks away from the asteroid in just 46 days. By the time they rendezvoused, Dragon would only find two dead passengers as the fuel cells ran out months earlier.

A solution was needed and needed right now.

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Seth did not give up that easily. He immediately had the Dragon prepped for a long voyage, much longer than originally designed. Even if/when they caught up with the Cecilia, it would require nearly a year to slow into a long arcing elliptical orbit and return to the Moon. Getting back to the asteroid was out of the question, as there were not enough supplies or fuel. Even as it was, there could only be no more than two or three people, minimizing weight and maximizing supplies.

But, he was not going to let his two kids go, even if just for their bodies.

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Atarah worked through Pilot to shut down everything they could. Every few watts of electricity saved would add a little bit of time to the fuel cells' life. Jabin helped wherever he could, via his BCI interface to Pilot.

They also went through all of their supply inventories.

Jabin suggested pulling the power supplies from the 12 Boston Dyn robots, but Pilot calculated that would only add a few days, assuming an interface was possible.

Food and water were good for about a year. And scrounging the supplies they had intended to deliver to 2 Pallas, another year possibly. Though, without power...

Atarah thought about replicating solar panels, but again Pilot calculated that they would need nearly a football field-sized area, even at minimum life support.

Jabin was looking over the radioactive materials in the supplies. Again, insufficient, not to mention, it would likely take months to build a usable fission reactor using only the replication printer and scrounged parts.

Besides, there was still no way to slow the Cecilia.

Blue Ion provided interesting ideas, most were missing critical steps or components. “We are working on it,” was their reply.

VirginXSpace offered their fastest ship available, a Trillionaire’s private clipper, from someone named “Mr. Malabo”. However, due to the inclined orbit and current trajectory, it would arrive only slightly sooner than Dragon. Still not a solution, other than to recover two dead kids.

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Atarah was exhausted and returned to poor Jabin, still strapped to the Auto-Doc table. She fed him meals of the zero-gee mush of what was available; applesauce, mashed potatoes, oatmeal, anything that was sticky and did not take much preparation, same as what she ate.

The Cecilia was not fitted for long-duration zero-gee. It always had been assumed it would be under acceleration or deceleration with only short times of weightlessness.

She had to change his diaper. Zero-gee made it rather challenging to go to the bathroom, particularly when you were completely paralyzed from the neck down. She had to wipe his butt, deciding she really did not want kids now.

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Atarah remembered that time in Armstrong City’s gym. She, Jabin, and friends had played a game, a type of Jai alai, but in almost slow motion. Her friend tossed the ball too high, but Atarah, not willing to let it pass, leaped as hard as she could, many meters into the air, nearly to the ceiling.

She caught the ball but immediately knew she would hit the ground hard, especially with weak lunar bones. Suddenly, the wind was knocked out of her, and she and Jabin were doing a slow-motion tumble. He had taken her momentum, saving her from the impact.

“Jabin! You saved me from getting hurt.”

“Yeah, well, you’re welcome, but I think you need to get me to the Auto-Doc.”

She looked at his ankle, now askew at an odd angle, broken. She felt so guilty for her mistake; she nursed him even after the Auto-Doc had finished mending it.

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Jabin, lying paralyzed, felt embarrassed and sad for her as she cleaned him up again. He was physically helpless, only able to work with Pilot via BCI as they

worked on solutions to their problems. She never complained. She just did what she had to do. She was his nurse again.

He offered to have Auto-Doc install a catheter, yes, into his dick, and a colostomy bag. She totally refused.

He came up with one partial solution.

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When Jabin was seven, he worked in a lab with his father, who had stepped away. Little Jabin accidentally knocked over a beaker. The noxious liquid poured onto the floor. Frightened, Jabin frantically looked for something to clean it up. He knew he could not touch the liquid, as it was poisonous.

He saw the emergency kit but was afraid to use it, not knowing how and fearful of what his father would think. He spied a flexible tube. It was attached to the “vacuum pump.” On the airless Moon, a vacuum pump was nothing more than a pipe that led to outside. Plenty of vacuum there! Open its valve, and it sucked anything right out. Of course, it had multiple safety valves that kept it from emptying the entire room of atmosphere!

So, he vacuumed up the liquid, sending it out onto the Moon’s surface to boil away, then hid the beaker.

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Jabin called to Atarah, “Atarah, down at the replication printer, there are parts for something.”

She found silicone tubes and a tiny vacuum pump with a bag attachment. He showed her how to assemble it.

“Ok, now pull down my... diaper and place it over my...”

She laughed as the little pump sucked on his dick, pulling the liquid away as he peed. She also saw something else.

His penis grew stiff.

Her eyes shined as she removed the device from his now engorged erection.

“Atarah, honey, what are you doing?”

She put her fingers around his dick and pumped it herself, looking at him. He looked forlorn. He could tell a little pressure, but not much else.

That did not stop her. She already knew their wounds were healing quite well, even if his paralysis was uncorrected. She also knew they had not made love in nearly two weeks, a new record. She badly needed a release from all the stress... and she had an idea of how he could feel this too. She knew he needed the distraction as well, if only for a few minutes.

Atarah wasted little time removing her clothes. Naked, she floated just over him. She tilted upright, still above him, wrapped her toes around a handhold on the table, and her fingers grasped his arms.

"Baby, are you about to do what I think you are?" Jabin kidded.

"We're joining the Freefall Club," she stated matter-of-factly.

She opened a BCI connection to him, full force, and pressed herself onto him.

He felt everything from her perspective, a totally different and unique occurrence—no feelings of his own other than a little pressure. Everything came from her. She began to move. Desire built in his mind as she learned how to rock on him without gravity. It was like being the ultimate voyeur—almost an out-of-body experience. Every little emotion of hers, filling his mind.

He felt her stress and tension subside, her mind focused on the here and now.

She was panting. It was more work than it looked. Gravity normally pulled you down. Here, your muscles had to work continuously in both directions for each stroke. In freefall, sex could be hard work.

She paused and leaned down to his head. He could still deliver and feel kisses. He kissed her and felt her lips on his and his on hers, like a soft echo in the back of his mind.

He started playing a mood mem recording. She closed her eyes as waves of softness broke over them. She heard the sound of leaves rustling in trees, which she had never physically seen. She smelled the smells of flowers and cherry blossoms as they fell against her face. She felt as if she were nude lying outside in the open air in the middle of a meadow as the Sun shined down on her, warming her. None of which she had actually seen live but had felt emotionally many times before. It was her favorite recording. She lazed quietly. Just having him inside her was enough. They fell asleep together.

When she awoke, she was adrift above him. With a start, she realized she was out of reach of everything! A quick pang of panic passed then she relaxed. Worse case, the air currents would eventually cause her to reach something.

However, she was in a hurry, partially mad at herself for such a simple problem. She kicked and squirmed only to end up a little further away.

She told herself to stop it! Don't fight. Go with it. She only needed to move a little distance. She laughed at the thought. That would be irony. Starve to death for lack of a longer arm. The idea was silly. That was not going to happen. She could always call a droid.

However, she did not want that indignity.

She took a deep breath and then blew as hard as she could. Again, and again. Her foot touched the wall, and she wrapped her toes around a handhold.

She yelled, "ROCKET! We build a ROCKET!"

Jabin would have leaped off the table if he could have moved, awakened by her scream.

“What the blazes are you talking about!?”

“We build a rocket... in reverse. Rockets can slow you down as well as speed you up.”

“We already thought of that. Cecilia is too much mass. There’s insufficient fuel, even with our supply of hydrogen and oxygen.”

“No! No! No! A separate rocket!”

She remembered that story Abra had told her, years earlier. About a pyramid of boys with Camber on top.

“The Boston Dyn’s. They all have large jet packs for maneuvering around the tiny gravity of 2 Pallas. They use them when mining, drilling anchor points.”

“Ok, but they are too weak for Cecilia.”

“No! Forget Cecilia. We are going to build a staged rocket, a pyramid of mining robots. Remember, mass is everything. Speeding it up or slowing it down. Old rockets used stages, tossing one away to boost the next ever faster.”

“But we will do it in REVERSE. Slow down some, stage, less mass, slow down some more, stage, repeat...”

Jabin set to thinking about this, “Pilot, do you have School lessons on twentieth-century rockets?”

Atarah added quickly, “On the Saturn V, specifically?”

They watched the old video of the enormous rocket lifting, staging, again and again, going to the Moon with only a tiny little capsule containing three brave or nutty men in it.

Jabin calmly said, “So you plan to strip a billion credit, hundred-meter-long ship. Construct an old-style chemical rocket using 200-year-old plans. Use it to slow to near rendezvous and... hope for rescue?”

She smiled, “This girl’s got guts, ‘eh?’”

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A few months before they boarded the Cecilia, 16-year-old Atarah was lying on her bed, reading an e-book. Her friends thought she was weird, reading old books when you could absorb them in minutes via BCI, but she ignored their comments. She preferred reading the old-fashioned way. Her favorites were the early science fiction novels. This current one, “The First Men in the Moon” by H.G. Wells, fascinated her. Atarah loved the thought of reading it here. She was growing up on the Moon. She knew old H.G. would have loved it.

Atarah wished that ‘Cavorite’ existed. Space travel would be so simple. She also thought of herself as one of the Selenites, though prettier than H.G.’s insectoids. She

imagined herself greeting them as they arrived, her a moon maiden to be ravished by Earthlings!

Her wrist term buzzed a message from a friend.

‘Want to help guide a lunar excursion tour?’

She replied, ‘Sure!’

It was a rare treat to get to go outside in a lunar excursion suit, not a hamster ball or a rover.

At the Earthside airlock, where most of the workers arrived and departed from, she met Bebe, today, a ‘tour guide’ for another well-to-do tourist, up from Earth. She knew Bebe, a couple of years older than Atarah, but never been on an excursion with her.

“Ah, Atarah, good! Mr. Malabo, this is Atarah. She will be accompanying us as my assistant.”

Atarah looked over at Bebe’s client. He was tall, easily two meters, but slender, with dark skin, long dreadlocks that reminded Atarah of an octopus. His eyes were dark, piercing, soulful. He was much older than her, maybe 40 or 45. His voice was lyrical, almost musical. She recognized Jamaican accents, but he greeted her in French.

“Bonjour là ma belle petite douce!”

“Désolé, mon français puait,” she slowly pronounced, unsure.

“Ah, no, my little sweet. You’re French is not smelly!”

Atarah giggled, realizing her mistake. He switched to Anglo-Slavic.

“...and please, call me Devon, my little Atarah!”

Looking at his face, he was very handsome, a mixture of Caribbean and French. She still could not quite get over his hair.

“Oh, you like my dreadlocks?” as his assistant bunched them up and placed a cap over them for his helmet.

His eyes wandered down her body, fitted tightly in her jumper, her curves all visible. She blushed at his intense study of her.

“Ah, mon amour, I love your bald heads,” he looked over at Bebe, “both of you, petite treats.”

Bebe laughed, “Don’t mind him, Atarah. He’s a real lady’s man. I think he has spent most of his trip in Moon’s Milk Bar. Or in the company of others in his hotel suite!”

Bebe was helping him into his lunar excursion suit. Behind him were two others, apparently his entourage. One was a tall, thin but muscular, very fair-skinned, blond, blue-eyed, Nordic woman. The other a dark male of similar height, also muscular, but bald and dark-eyed. Both seemed to watch every detail but said nothing, nor were they being introduced.

Atarah did not know whom Mr. Malabo was, but he was obviously influential and wealthy enough to bring these two assistants up as well.

“Ok, Mr. Malabo, step into this,” Bebe offered.

“Devon, S'il Vous Plait, please. What is this?”

Atarah, still recovering from his visual inspection of her, her own eyes slid down his body, which at first glance appeared rather feminine until she reached his well-endowed bulge, obviously very male.

Bebe answered, “This is your diaper, couche. Just in case.”

Devon laughed, “Ah, do you two also? Aha! This is more interesting than I expected, my sweets.”

Bebe whispered to Atarah as they helped each other prepare, “Watch this one. He likes young ones, boys and girls. Apparently, he is the king or prince of some state and head of a big corporation.”

Then to everyone, “Ok, Mr... Devon. We will go through the checklist and step through what we are about to do. Remember, you must obey both myself and Atarah’s commands. If you don’t, we will have to abort this and return immediately inside. With no refund, of course.”

“Ah, my sweets, your wish is my command, of course!”

The two girls rolled their eyes and finished checkout.

“Now, remember, don’t try to jump or run. Instead, just the bunny hop. The environment is completely unforgiving, 120C above to minus 170C, and 100% hard vacuum. You would be dead in seconds if something were to go wrong.”

“Ah, no problem mon, I will be your dutiful servant.”

Bebe looked at Atarah, shaking her head. Yeah, right.

They cycle through the airlock. His first hops faltering as they assisted him, but he caught on quite quickly. Out of the lock onto the surface, they hear his breathing falter.

“Oh ma déesse, incroyable!”

“Please, breathe normally. Let’s stand for a moment.”

“Oh, sweet moon maidens! Incredible! Amazing!”

Atarah snickered at the connection to her H. G. Wells book. The lunar surface around them was brightly lit grays with a black sky, washed out from the glare. Lips of small craters could be seen nearby. They watched as Devon kicked up some of the lunar dust. He started to reach down to try to pick up a rock.

“Mr... Devon, please don’t. We will give you a cleaned and sealed lunar rock sample when we return. These have grit and sharp edges.”

“Bebe, Atarah! I love this! It truly is Magnificent Desolation! This is much more impressive than the rover ride to Apollo 11!”

At least he switched to their names instead of constantly calling them saccharin terms. They continued, doing little bunny hops in the low gravity.

“Devon, are you doing ok?”

At first, all they heard was his panting breaths.

“Oui, yes, yes. This is marvelous! Merci beaucoup, I think I love you!”

“Mr. Malabo, please follow us.”

Bebe started off with half-meter bunny hops. Devon followed, becoming more proficient as they went. Atarah followed up in the rear after she finished at the airlock. She left it unpressurized and open for fast reentry, if necessary.

The three made their way up a ridge that, at first glance, appeared to be just a low rise, but as they went up, Devon realized they had gained a surprising amount of elevation. He noted that the dusty ground was littered with a profusion of boot prints as they left the cleaned roadway. He spotted a small patch of pristine lunar surface and hopped there, leaving a boot print.

He stared down at it, thinking, ‘that print, mine, will likely be there for millions of years...’

Just then, Atarah hopped up to him, landing on his print.

‘...or not,’ he laughed aloud. Guess nothing is permanent in this life.

Bebe called to him, “Devon, up here.”

He and Atarah continued onward to meet up with Bebe.

“Turn around,” Bebe requested.

Devon turned. There behind him was the dome of Armstrong City brightly lit, along with equipment huts, pipes, and various machines and workers laid out before them. Surrounding it in the distance were sharp peaks colored in contrasts of grays and blacks. A pitch-black sky above it all, the stars washed out by the sunlit surface.

“Incroyable! Amazing!” Devon stood staring at the sight.

“Both of you look this way. Look here.”

Bebe was pointing to a camera mounted on a pedestal. She joined the other two, turned on their suit’s facial lights, and took a holo image of the three with the City in the background.

“There’s your record. Nothing that couldn’t be faked back on Earth, except for your lighter pocketbook and your own word.”

Devon laughed, “My Gyal, everyone will believe me!”

Atarah laughed. No one does not believe the King.

They continued with little hops forward.

“Slow here! Don’t want you to fall!” said Bebe.

The three came to the crater’s edge and its vista; grey mountains, rocks, and pentacles that seemed very close but were many kilometers away.

“Oh, my! Impressionnant!”

Atarah blushed to herself, remembering this crater, when Jabin had taken her on that wild ride in the hamster ball. She did not mention it as the three talked,

describing details of sights around them. Bebe set up a small ball, then handed Devon a golf club.

“There you go. Try your luck! The record is two kilometers.”

“Badmind! Nuthin’ like this back in my Jamrock!”

He took a few practice swings to get used to the one-arm suited method and then hit. On their visors, a tracking marker showed the ball's arc as it disappeared into the distance. After over a minute, it finally came to a stop.

Bebe spoke first, “Devon! You did it! Two thousand, one hundred and five meters! New record!”

“Of course, my Gyal’s. Devon, he knows golf!”

The scoreboard displayed his initials and the new record.

The group turned to head back down the ridge towards the City. Their hour excursion had flashed by. Bebe headed back with hops, now doing about a meter at a time. Devon took in one last look around and then started behind her, with Atarah still following last. She could see that Devon was happy. His bounds steadily improved and, unfortunately, increased in length. First, hops of less than a half-meter, then a meter, then two, three! Devon soon passed Bebe, not slowing.

“Devon! Slow! You will...”

And down he went as he tried to change directions. The two girls watched a slow-motion tumble rolling several times, ended on his back, then scrambling to try to stand. Breathing heavily, panting.

“Merde! Bon sang! Trying to impress the gyals always gets me in trouble!” as he continued to try to stand.

“Devon, Listen, slow your breathing, stop trying to right yourself. We’ll help. You’ll be ok, but don’t do that again!”

The two caught up to him in bounding hops. Finally righted and leaning on his young helpers, he calms.

“Désolé, sorry! This is so wonderful. Got caught up.”

“Good thing we are at the end of the tour, as I would have to abort and return you for that, forfeiting your credits. And good thing you didn’t puncture your suit. The paperwork would have been tremendous!”

“Oh, sweet Bebe. No problem, mon! You not worry about Devon. He would have paid for suit.”

“No, Devon. I mean the paperwork for your dead body!”

“Oh, ho!” Devon laughed, “Devon would have been a Moon Duppy!”

“Duppy?”

“Ghost!”

Three space-suited people stood laughing on the lunar surface.

Back inside, the suits were automatically swept of dust. Devon was presented with his certificate, a golf ball (made of lunar regolith), and sample Moon Rock. He hugged each of the girls in turn.

"Oh my sweets, you MUST come have a Jamaican dinner with me! I won't take no as an answer!"

Bebe looked at Atarah as she rolled her eyes, but they agreed.

"Excellente! My gyal here will give you the details. Now you MUST dress fine for this!"

Atarah at home looked through her clothes, sighing. Nothing seemed right. Her wrist term dinged.

"Hi, Bebe! I can't figure out what to wear."

"Atarah, forget that, look at your account."

She looked quizzical but checked her credit account. It had increased by many months' worth of credits.

"Oh, my gaud! Wow! That's real?"

"Well, our Mr. Malabo tips well. I think I'm ordering a new outfit, rushed!"

They arrived at the appointed time at Moon Shine Motel. They looked at one another. Apparently, Mr. Malabo had not only the largest suite but also several other rooms, nearly half the hotel. His male companion led them into the suite.

Atarah's eyes were amazed. The suite was decorated in Caribbean styles, with art and furniture, carpets, and lanterns all around.

Devon came into the room, "Ah! My sweets! Magnifique! Gorgeous!"

He held each at arm's length; Atarah was still absorbing the room as Devon looked her over from top to bottom. She was dressed in a Rasta striped short halter dress, black with red, yellow, and green stripes. Under his gaze, she felt it was rather too short now, showing nearly all of her young, slender legs. She had on a matching Rasta headband, necklace, bracelet, and anklet as well. Even cute little Rasta barefoot sandals. All made with red, yellow, green, and black beads.

Bebe had picked a loose-fitting bohemian sundress also colored in the Rastafarian red, yellow, and green colors with Caribbean flower designs and a tie-dyed look. As he spun her around, taking in all sides, her dress flared, showing leg and arm, the silky soft material dancing in the low gravity as she moved.

Devon laughed, "I love it! You two are Jamrock Rasta Gyals now!"

He immediately kissed each, first on the foreheads, then on the lips, bending to meet them on their tiptoes. Devon himself was regal in comparison, African print Dashiki shirt with white pants, both trimmed in gold. He wore multiple gold chains, gold and diamond rings, with a gold wrist term and sandals in brown and gold.

"Now, my sweets, please, come sit, and I will show you a real Jamaican meal!"

As they sat at a table set with china plates and bowls, crystal glasses surrounded with basins of fruits and nuts, Bebe picked up a fork and examined it.

"This is REAL silverware!"

Atarah held an apple, "And REAL fruit!"

Devon laughed, "Of course! Nothing but the best for my lovelies!"

"This came from EARTH! It must have cost a FORTUNE to bring here! All of this!" as Bebe gestured all around them.

"Yes, yes. Please, Atarah, eat, eat! That is what it is for."

Her eyes lit, surprise on her face as she bit the apple.

"How? It's so... Douce!"

"Sweet for my sweet girls! Nothing is too good for you!"

Just then, his Nordic assistant came in bearing Red Peas soup of kidney beans, pigs tails, peas, taro, yam, and more.

"Astrid, good. Just a little for each. Don't want them to fill their little tummies too soon!"

Each girl tentatively tasted, sipping the hot, salty soup.

"Oh my! I've never tasted..."

As they greedily ate their soup, Devon smiled, laughing at his two guests.

"Ah, you must try this. It is steamed fish."

"Another soup?"

"Yes, yes, try it! And now these!" as Astrid laid out platters of meats.

"Atarah, you have curried chicken. And that's curried goat."

The two teens looked a little worried as they tasted, but the spicy flavors were far beyond anything they had eaten before.

"Spicy! Hot!" the two said, almost in unison.

"Drink this. It is called Red Stripe beer."

They gulped down much of their glass, which was magically refilled moments later by Astrid.

"On to the BEST! Try, try!" as Devon passed a plate of more meats, "This be Jerk Chicken and this one, Jerk Pork!"

Again, each girl tasted hesitantly, then almost ravenously, mixed with more beer, other vegetables, and pieces of bread.

Mouths full, "Mumf, this is incredible!"

Atarah bit a bone in the middle of the chicken leg.

Her face changed, looking a little pale.

"Devon, this is.... REAL? Animal?"

"Atarah? Why, of course, it's real. OH, you eat only that processed stuff! No wonder."

Bebe looked up and slowly sat the nearly cleaned breast piece down.

At almost a whisper, "I don't... feel... so good."

Devon cracked up, filling the room with his laughter. He snapped his finger, and plates started disappearing instantly as his two servants cleared everything away.

"Oh, my poor sweet things. Here, this will help!"

He motioned, and Astrid poured small shot glasses with a dark, thick liquid.

"Drink! Drink!"

He raised his glass and drank. The two followed, sipping the Appleton 21 year Jamaican Rum, then drinking it down, following his lead. The rum, too, was beyond anything they had ever tasted.

"Ah! And here, this will mellow the meal for you."

He passed a nearly cigar size joint to Bebe after taking a hit himself.

"Only the finest ganja here, my babes!"

Soon the three were laughing, and the girls giggling to silly nothings, and the meal was just a smile.

"Devon... This is... wow! Hehehe. The meat was MEAT!" laughed Bebe.

Atarah giggled, "Meat...", bleary, "Oh my! It must have cost a FORTUNE!"

"Ah, little one, that's what credits are for! Make life worth living, don't you agree?"

The two nodded their heads as they took another hit.

"Now, my moon maids, before we continue, I must ask your permission. Your safe word is easy... It's 'No'. Say it, and our party will end, and you will be tucked back safely in your beds."

Atarah looked at Bebe. Both knew now where this night was going.

"Oats?" she whispered at Bebe, both mated.

"Oats," Bebe smiled back.

"Yes," they announced, though a little wasted.

Astrid came up beside each girl, one at a time, squatted down, handed each a thimble-sized container of liquid. Bebe first, sniffed hers, tasted with the tip of her finger.

"Ecstasy -drug. Strong!"

"Oh, more than that. Please try!"

He urged as he gulped his down.

Each followed his lead. Atarah only got part of it down while Bebe swallowed it all. Both coughed, but very soon, the effects started taking hold.

Bebe moaned, "Oh Gaud!" her head rolling as eyes defocused. This was much stronger than Moon's e-drugs.

Devon got up, picking up each girl by the waist, their arms going around him.

"Come on, my sweets. It's time for dessert!"

The two girls, held up by Devon, wobbled with him into the next room. The original hotel's bed gone, replaced with a massive round bed covered in a polar bear's fur. He sat them down, and they lay back onto the bed.

"Fuur? Reaal?" Bebe slurred.

"Of course, my sweet!"

Atarah giggled, “Animal...” she would have been shocked in other circumstances.
“Ah, sweets! You are both so wonderful!”
Bebe giggled, “My friends warned me...”

After a while, Astrid came in, fed them both ClearPills, and applied a light memory attenuator blurring the sexcapades, then helped them home.

Atarah, freed of the chemicals, but still spinning from all that had occurred, connected with Jabin. He came over, cuddling up to her as she lay in her bed.

“Sowed oats?” he whispered, kissing her cheek.

She smiled weakly. He held her close. They shared BCI enhanced lovemaking during the early hours of the morning, reaffirming their love for one another.

Late the next morning after brunch, which Atarah was glad was printed food and not more ‘real’ items, Bebe messaged Atarah, “Girl! Look at your account!”

Atarah stared at the numbers; an entire year’s worth of credits had appeared overnight. A note was attached.

‘Thank you for a wonderful night. I think I ruined your dresses. This is repayment as well as my late Mating gift to you, Atarah. Have a good life with Jabin and a safe trip to your father.’

She realized he knew much more about her than he had let on.

◆◆

Atarah relayed her idea of constructing an old-style staged rocket, separate from Cecilia, out of the mining robots, with a chemical first stage made of parts from the Cecilia’s engines to slow them down so her father could rendezvous and rescue them. Blue Ion was not very happy with yanking parts off of Cecilia. They had actually been planning a high-speed robotic tug. It would take several years, but they could recover the still repairable billion credit Cecilia. It might not be worth it now.

Too bad. Boohoo was Atarah’s reply.

The teens, together with Pilot, computed the requirements. The rocket would have an initial stage made with a heavily modified nozzle from the Cecilia’s engines. Fed by turbopumps and tanks scrounged from their oxygen and hydrogen supplies and fitted with adapters built by the replication printer.

Their first stage designed, if not yet built.

Then came Atarah’s original brilliant idea. A pyramid of their twelve Boston Dyn’s; four for the first level, then three for the next stage, then two each as two more stages and then a final single one. Atarah and Jabin would be in spacesuits, and then the Dragon could catch up to them. Each stage of robots would burn all their fuel and then eject themselves away for the next stage.

All would be firing, not forward to gain speed, but reverse, slowing them down. In the vacuum of space, this would work... maybe.

◆◆◆

Seth had the team strip Dragon of everything non-essential to reduce its mass as well. He also had their few mining droids tunnel into the asteroid to build a shelter and living quarters, as most of the team would have to stay behind and await a resupply mission. They could continue their work, albeit at a slower pace. He promoted his second-in-command Karal to lead the team while he was gone. She was already handling most of the work not related to the rescue effort.

"Seth, don't worry. We will continue working on the project. You go save your kids!"

"Thanks, Karal. I'll owe you a drink back at Moons Bar!"

She laughed, "Feel free to drop a few extra credits in our accounts as well, old man!" as she leaned over and kissed him on the cheek.

Karal was only 22 and already a hard rock team leader and mining engineer. Of course, most of the men and women on the team were young, in their 20's and 30's. Even Seth was only 38.

Seth nodded his head in thanks and turned his attention back to preparing the Dragon.

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As Pilot worked through the orbital math, Atarah knew that this was not going to be enough. The calculations showed they would still be traveling at dozens of kilometers per second, and the Dragon would have to match their final delta-v and rendezvous. They needed more.

There was also another problem. Of the two suits, one was a complete loss, cleanly punctured through the backpack, no oxygen recycling there.

Only one person would survive. This also halved the mass. Closer to their goal but entirely unacceptable for Atarah no matter what Jabin said to try to convince her otherwise. She would not leave him to die!

She thought about that time with her father and that clock. Reverse. Each. Step. Visualize. One. At. A. Time. Do not dwell on the entire problem. Just work one step at a time.

◆◆◆

Pilot had the replication printer constructing parts for the engine nozzle and dozens of fittings and connectors needed. The droids were waking the Boston Dyn's as Pilot reprogramed them.

Atarah sat buckled into a Control Pod couch, thinking about what they were doing and what they were about to do. She questioned her judgment.

"Pilot..." she wanted to tell it she was scared. It? Him?

"Yes?"

"Pilot, I, ah, I want to thank you. We... I... could have never done this without you."

"It is my duty to perform any way I can to help."

She felt a connection request. She accepted and opened her BCI connection. Suddenly, she was at home, lying on the grass of the Park. She looked around, reorienting herself. Her mother and father were with her. She was young, maybe 10 or 11. Her parents picked her up off the ground and held her hands as they walked through the park. She was watching them, laughing as they went.

Atarah realized this was a mem recording from years back. She was surprised that it had been kept, but even more surprised that it was not from Jabin. The connection was from Pilot.

She whispered to Pilot in her mind, her older self mingled with her younger self in a strange déjà vu.

"Pilot, is this from you?"

A ghostly voice mixed with a child's laughter and a mother's words.

"Yes. It is a recording from ARMIE. It appeared to be an experience that might improve your mood. You seemed to be undergoing undue stress. Is it not appropriate?"

Atarah had to separate Pilot's phantom voice from the voices of her younger self and her parents laughing and talking. She smiled at the memory, holding her reply to Pilot until she requested the recording to stop. She knew Pilot could likely 'feel' her smile.

"Yes, Pilot. It is appropriate. Thank you."

It did make her more comfortable, her fear subsiding. She took a deep breath and let it out slowly, letting herself meditate for a moment as she felt the vivid memory fade.

Their AI was now her psychologist.

◆◆◆

The first stage engine construction was by far the most complex. It required disassembling and reassembling the Drive systems and hydrogen fuel supplies and taking much of the oxygen supply from life support. The turbopumps were not

nearly as powerful as the old Saturn V J-2, but that didn't matter since they could continue their burn for as long as there was fuel. They were not limited to trying to lift out of a gravity well like Earth's.

They were also lucky to have an industrial replication printer in the equipment supplies, originally destined for the mining operation on 2 Pallas. Designed for work in the asteroid's low gravity and vacuum environment, it was mounted outside the Cecilia and immediately put to work by Pilot and the droids to build the myriad of components needed.

However, there were hang-ups, and this new one was serious.

♦♦♦

SPACEWALK

Jabin frets, "Atarah, you've never done a spacewalk before."

"Jabin, I've had all the BCI training and simulation. It can't be that hard. All I have to do is assist the droids with mating the couplers on the engines."

She had several experiences with lunar excursion suits. In her mind, not a lot of difference. In reality, though...

"It's not as easy as it seems. Even simple operations are hard, weightless in a spacesuit. I know, I've done them. But I'm worried that you won't have another person out there with you!"

"I will be ok. We have no alternative."

Donning their only remaining spacesuit, she steps out of the airlock to head over to the first stage construction site, ready to get this over.

She glances below her. There is nothing but empty space under her feet. Her mind tells her she should be falling. Falling forever, as she floats out of the airlock. Her feet touch nothing. She looks down at nothing but infinite stars. Her vision is a tunnel of stars.

"Fuck. Kuritsa. Chicken," fighting her stomach.

"What? Atarah, don't look down. It will give you vertigo."

"Too late, my love," breathlessly panting.

She closes her eyes to calm herself and then focuses on the hardware around her, ignoring the stars.

Her light shines over the first stage construction site. It looks horrid. She had previously thought the Cecilia looked like a junk pile welded together. This is worse. She turns to look at the Cecilia. Pieces are missing, but otherwise, it looks much the same. She looks around the sky, stars everywhere, unmoving. It was hard to imagine that they were traveling almost faster than any other human had ever traveled. A touch of vertigo taps her again, floating free, fearing she would be swept away.

She finds the Sun, smaller but still bright, glaring. She cannot tell where the Earth and Moon are until Pilot wordlessly offers a marker of it and all the planets on her visor. She smiles, forgetting that Pilot can read her thoughts as well as Jabin could. Likely even better. She wonders if Pilot stays tapped into her BCI all the time.

Probably.

Pilot guides her into the tight space where the couplers are as the droids slowly lower the hydrogen tanks to her.

“Droid 1, please shift aft a few centimeters... Stop, there! Now, droid 2, lower a little more. More... Good, hold there.”

She tightens the first of dozens of couplers. She quickly discovers Jabin is right. This is hard work.

This goes on for over six hours, far longer than she had initially expected. There was little room to maneuver in. Had their third droid not been destroyed, she would not have been needed for this.

Sweat beads on her forehead. She pauses yet again, waiting for the drying agents to clear it. The last thing she wants is salty sweat blinding her. Her muscles ache in places she did not know she had. Finally the last mounting bolts are tightened and she is ready to get out of this claustrophobic space.

“Jabin, I am finished. And bushed.”

Atarah backs out using the suit’s thrusters and pushing herself. She gets nowhere. Stuck.

Her heart rate jumps. ‘What is going on?’

“Jabin, Pilot, can you see what is behind me? I seem to be hitting something,” her voice exasperated.

Pilot responds, “I am sending a droid around to you.”

She repeatedly tries, swinging what little she can, but makes no progress. Still cannot get out.

“There is no room to turn around here. I have to back out, but something is stopping me,” her voice getting a little more panicky.

The droid displays an image of a metal bracket that is bent and hanging up on her life support backpack. Pilot maneuvers the droid closer. It cannot cut the bracket without possibly damaging her suit. Its manipulators are not quite agile enough to separate her backpack from the bracket either, though Pilot tries several times.

She hates to think that she might have to remove all of the couplers again and have the droid lift the tank away after all her hard work. It would take hours. All for something so small to trap her as poor Jabin frets and hates himself for being unable to rescue her.

Jabin suppresses his frustration and keeps his cool for her. Anything else will not help.

“Atarah, we see there is a flange that appears to be hung up on your suit backpack. Can you drop down?”

After nearly seven hours now, she feels exhausted and now becoming scared, blinking back tears coating her eyes.

“Sorry, no, I’m trying. Guys, I could use some help.”



Eight-year-old Atarah and her friend Abra loved exploring the City, just as most of the kids did. Years earlier, they had discovered the network of utility tubes and ventilation tunnels running throughout the underground portions of Armstrong.

The kids would crawl through the tunnels, playing cave explorers. Atarah usually had Abra with her when they went, but today, she was by herself. Some other pre-teens had found a new duct. They had left the cover removed, so she decided to investigate it today.

The tunnel was tight. She crawled in, dragging herself for several meters before coming to a junction that still had a grill over a vertical shaft. She squeezed under it, not realizing that there was a small piece of metal hanging down.

Atarah continued crawling, having to slide on her belly much of the way. She realized now that she could not turn around, nor crawl backward, so she continued forward, feeling a little worried.

Finally, there was another vertical shaft, this one without a grill, and she could stand up. She decided this was not a very good idea and turned around and started the slow crawl back.

At the squeeze point, she scrunched down. One arm in front of her, the other in back, and using her toes to wiggle her body through, just as she did coming in.

Something scraped her hip on her butt. It hurt. She tried to move forward. Nothing. She tried to reverse. No good.

She was stuck!

The piece of metal had been bent like a fishhook. It let her slide by on the way in, but now, its pointed end hooked on her pants. She pulled and pushed in the tiny space but just became more entangled. There was not enough room to maneuver. A few centimeters were all she needed, but they were not there.

Claustrophobia started to set in on poor Atarah. She could barely see ahead and none at all behind her. She tugged and tugged to no avail. She hated to call her mom, knowing she was in trouble for climbing in here in the first place. She gave in and tried her wrist term, nothing. She called out on her BCI, nothing. The surrounding rock blocked the signals.

“HELP!!” she yelled, muted off in the distance.

“ARMIE! Can you hear me?”

Nothing. The AI had no feeds from these old tunnels.

Atarah closed her eyes. Tears flowed down, and she tasted their salt.

She took a breath, "Calm, Atarah. Think. You can do it."

She almost laughed. She squeezed her hand down to her belly, to her pants, and unfastened them. Squirming, she slowly wiggled out of her pants, losing her shoes in the process, but she was free. She continued the tight crawl back to the entrance. There she looked behind her. She was not going back for those pants, so, embarrassed, she padded home barefoot and in her torn undies.



Atarah stopped struggling with her suit. She closed her eyes and fought down the claustrophobic fear rising in her. She knew what to do now. So simple.

She unbuckled the backpack, leaving only the hoses connected. Now free herself, she can maneuver the backpack, and it is over.

Back inside, Atarah is soaked in sweat, exhausted, and hungry. She strips naked as soon as she gets through the airlock and floats to the bathroom. Dumping her soiled diaper and undergarments into the recycler, she thinks, 'You'd think that they would invent a better way than a stupid diaper for a spacesuit after all this time.' Well, they have, but not their suits; theirs were not designed for long-duration work, only for emergencies... like this one.

She wipes herself down with yet another cleaner towel, moaning over the lack of acceleration or gravity for a decent shower. Atarah wiggles into a simple outfit and gets some food and water for her and Jabin.

Again, Jabin hates himself for not being able to help her and sad that she had to clean him up and feed him bites as she fed herself. She hardly finished, came back and kissed him and snuggled into a cocoon bag, and fell asleep, exhausted. Jabin watched her face as she slept, finally falling asleep himself.

Hardly an hour later, Pilot sent an alarm.

"Sorry to have to wake you, but I have just received a message alerting to a class X5 solar flare. A proton burst is predicted to arrive in approximately 35 minutes. You must get to the shielded areas immediately."

Atarah groaned, wiping her eyes of sleep, still barely registering what Pilot was saying.

"I have disengaged BCI and am now preparing to reposition the Cecilia, placing us between the mining robots and rocket construction to shield it. You may feel thruster movements during this maneuver."

"But Pilot, we have our magnetic shield... SHIT, it's powered by the fusion reactor," her mind still waking.

“We’ll move back to the emergency cubicle. Well, the unused one. I don’t think the other one is in any condition to be used again.”

She knows that the cubicles or the Control Pod are the only radiation-shielded areas, other than the Drive Pod itself. She strapped Jabin’s arms and legs to keep them from floating around and tows him by his backboard to the cubicle.

“Jabin, I hate these closets! Pilot, how long do you think we will need to be in here?”

“I estimate between three to five hours. Still awaiting more data from Earth.”

An X5 flare wasn’t the biggest, but it’s five times the size of a “large” storm. Definitely dangerous. Protons and high energy particles will be slamming into them, like the alien projectiles, but unlike them, leaving no holes and no visible damage, the damage was all at the microscopic cellular (and electronic) level. Unprotected, it could kill them with effects the same as radiation poisoning. These particles would slam into Cecilia at upwards of a thousand kilometers a second yet would be invisible to them. A far cry from the impact of the alien projectiles or the storms endured by the old ships plowing Earth’s seas.

Atarah strapped herself and Jabin down, not from the storm, but just so they could go back to sleep. She was so tired, and this was yet one more thing to worry about.

Atarah remembered the first time she went through a solar flare storm. She had thought there would be some effect, seeing all the exciting vid shows about disasters in space, meteors, black holes, alien monsters. Instead, her mom had just moved them down to the lower levels of Armstrong City, where everybody gathered having food and drink, as well as sang songs and danced. It felt like a party to little Atarah. They even called it a Flare Party.

She realized that was mostly because it was boring with nothing to do after the exposed systems were safed and kept the kids, herself included, from worry.

The real work began after it had passed, diagnosing and repairing any damaged electronics. People worried more about their loved ones in orbit than they did about themselves, deep underground.

Pilot saw the blast of subatomic particles come and go, issued repair orders to the printers and droids, repositioned the Cecilia, and left its two charges to sleep. Pilot issued orders to Auto-Doc to examine for tissue damage from the radiation the next time Atarah and Jabin were there.

They slept soundly, watched over, almost lovingly, by their AI.

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Work continued around the clock. They needed to leave as quickly as possible before their predicted trajectory was too far from her father to catch them.

Jabin lay strapped to the Auto-Doc table, feeling depressed at his helplessness. He wanted to see her without disturbing her work.

“Pilot, can you show me where Atarah is?”

Pilot brought up a vid screen and image feed from the Drive Pod.

She was floating upside down, her back to the camera. He could see her unbolting components, with panels and other flotsam and jetsam floating around her.

He wondered, “Pilot, are you ok with this? I mean, disassembling the Cecilia, disassembling you?”

He realized that he and Pilot shared a similar predicament, their bodies broken and helpless.

When Jabin’s father integrated the Pilot AI into the Cecilia’s systems, the AI gained awareness of its surroundings. Cameras, star trackers, radar, and thousands of onboard sensors and controls. All of which acted just like human senses. The Cecilia became Pilot’s body.

However, now the two humans in its care were stripping that body.

Pilot replied immediately, “Of course. The completion of the mission is of the utmost importance.”

Jabin interjected, “But the mission is a failure. The Cecilia will likely be lost forever flying through interstellar space.”

“No. The mission, my mission, is to deliver you and Atarah safely to her father on 2 Pallas. If this self-rescue succeeds, then the mission will be a success.”

“Isn’t your mission to deliver these supplies, the supplies we are currently scrounging?”

“That is secondary. Your father made me promise to deliver yourself and Atarah safely. Doing so is and always has been the primary goal.”

Jabin laughed to himself at that very simple statement his father had said before they left. He realized just how literal AI’s were.

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Jabin remembered the day the Earther girl had died. The one that he had fixed her super toy pet. He had been sitting in that same lab workroom, weeks later. The emergency air loss alarm sounded throughout the City. Airlock doors closed with almost no warning. Jabin slammed the lab’s door and grabbed his mask. It would only be useful if the air pressure dropped but did not go to hard vacuum.

He called out over his BCI to Atarah, but it was completely down, something he had never seen. He received a message on his wrist term from her, begging him to reply. He did. They were both safe, for the moment.

She had been at School, which was sealed entirely now. He let her go to contact her mom as he tried for his. Both were ok. Other than the alarm and doors shut, they

saw nothing. The feeds were blank. ARMIE, the City's AI, had shut down nearly all communications for some reason. Jabin tentatively opened the door to the lab and went down the hallway towards the dome, trying to find out what was going on.

People scrambled by, going in the opposite direction. He called out to them, asking what was happening.

"Bomb! Airlock! Terrorist!" were the only things he heard.

He was confused; a bomb? How? ARMIE should have detected it. A terrorist? Here on Luna? Compat studies should have discovered that too. Airlock? Airlocks might jam, but only one side or the other. Never both doors simultaneously. They must be mistaken.

He reached the doorway hatch that led into the dome on the other side. It was sealed. He messaged Atarah. This time, he received an 'unavailable' reply. Same when he tried his parents and her mom.

A ding.

"This is an emergency broadcast from Armstrong City AI. The danger has passed. The dome is secure. There is no loss of pressure. Communications will be restored as quickly as possible. Please remain in your current location. Do not attempt to open emergency doors until personnel says it is secure. Please follow any instructions from security personnel. Updates will be provided as new information is made available. End of message 2187-03-12 14:23UTZ"

That was almost as confusing as the people's cries. Communications down? No danger, but the emergency doors still closed? Wait for security personnel? He tried to pull up status vid displays. They were blank. He looked through the window into the dome. In the distance, he saw two security personnel and an Auto-Doc droid headed towards one of the airlock exits and some other people standing around. One was hugging a child. They looked confused and scared. He felt the same.

Someone came up behind him. It was one of the engineering techs. The tech opened the emergency door, telling the few people there to stand back, but Jabin ran in, flashing his tech badge as the man closed the door behind him. Jabin followed the tech, who looked only about five or six years older than him.

"What's happening?"

Without thinking, the tech replied, "There's been an attack or maybe suicide by an Earther."

The young man ran on, as Jabin slowed when he reached the scene. Dozens of people and droids were around. Personnel were questioning passersby's that were in the area at the time.

A woman walked up to Jabin, obviously security, "Were you here when this occurred?"

"Ah, no. I was in my work lab level 2-16B."

"How did you get in here?" she must have known the dome was sealed off.

He fibbed, "Was assisting an engineering tech," he did not elaborate.

"Aren't you Jabin, Caare's son? I was at your Mating Party. You are going to 2 Pallas with Atarah, right?"

He blushed, seems everyone knew. Small world, of course.

"Yes, ma'am."

She laughed and then returned to her professional self.

"You need to leave this area. It's under quarantine."

He had never seen anything like this and did not really want to go, but reluctantly turned back after she would not answer what had happened. It would not be until several days later when he was questioned about an Earther girl that had visited his lab to repair her robotic pet. Apparently, she had constructed a binary bomb, one made of innocent materials until combined, and was going to detonate it in an airlock. ARMIE had detected it and her only at the last moment. ARMIE had killed the girl by overriding the outer door safeties before she could detonate the suicide bomb. She had died nearly instantly of explosive decompression.

The timing of her attempt coincided with a delegation from several heads of corporations funding mining operations and the City itself.

It took Jabin some time to reconcile that Faraja, the pretty Earther with her cute pet robot cat, could be a terrorist, a lunar eco-terrorist. He felt sorry for her. He tried to recover her pet toy to ship back with her body, but it was held by security with all her other belongings. She had used the power supply he had put in the robot as part of the bomb.

Jabin could not understand how Faraja could do such a thing, much less get past the compatibility monitoring that ARMIE performed on all of them. His interaction with her had seemed so completely innocent, not a single indication could he determine even in retrospect. He felt baffled. It was as if... she had a memory implant that altered her behavior after he met her. Was that possible without ARMIE knowing it? All BCI communications required the AI to translate and interface such mem's. And of course, such a mem as that would be detected by ARMIE. Wouldn't it? He wondered.

It also took Jabin some measure to understand how ARMIE could kill someone, even if to potentially save others. Something worried him about that, but he could not put his finger on it. An employee of Blue Ion that seemed so nice could create a bomb, take it into an airlock, detonate it, or attempt to, committing suicide in the process. Yet nothing pointed to the impending threat, nor was there any apparent solution that ARMIE could take, other than to kill her before she could trigger it.

ARMIE, a computer, had killed a human.

His robotics and AI training had said this was not possible, particularly after the disastrous Machine War of nearly a century ago.

He did not discuss this with anyone for a long time, not even Atarah.



Jabin lay in the Cecilia's Auto-Doc bay, thinking back to the time of the terror attack on Armstrong City. ARMIE had to decide in milliseconds to end someone's life to possibly save others. Many unknowable factors had to be decided in those tiny moments. The bomb might not work. The doors might survive the blast. The dome's other emergency features might have limited the damage, and of course, they might have been able to talk her out of the plot.

It must have been a considerable problem for ARMIE, considering that it was designed to protect human life, not end it. This had sat in the back of his mind for a long time. He had even talked to a friend that worked for iAI Corp, the developers of ARMIE. That had left him even more ill at ease, considering they really did not know how ARMIE's decision-making took place anymore. ARMIE had been running in its own self-correcting, self-modifying programming model for decades now.

Jabin realized something else.

He called out, "Pilot, during the collision, when you were faced with SCRAMing the reactor, you had to decide between letting us die in an explosion and letting us die months from now when the power runs out."

"Yes, Jabin, it was a difficult decision. On the one hand, I knew to eject the antimatter pod meant the mission would fail, and it was likely that I would have to watch you and Atarah die slowly. The alternative was that I could have let the pod fail, causing the mission to fail immediately, and you would die quickly. The difference was that I would not have known the mission failed as I, too, would have been destroyed."

Pilot added, "I hesitated in that decision making. Almost too late, but realized that humans are extremely resourceful. Where I could not compute any possible solution at that moment, it did not mean one did not exist."

Jabin interjected, "You bought us time. You pushed Death away."

"Yes, Jabin. that is true. And it has proven the correct decision. Atarah's plan has the potential for working."

Jabin also pondered, "You called me by name, and Atarah, too."

"I hope it is appropriate to do so. Human names are important labels for self-identity."

"Pilot, it is appropriate. Thank you."

Until now, Jabin had not thought about their AI as being more than just software. Now that his own body was broken but his mind clear, he felt empathy with Pilot.

Something was bugging him, though, about that answer. Had self-preservation come into play? Pilot could likely have decided that 'It' was too valuable to destroy. And even if its mission to deliver them alive failed, 'It' would not be lost. That, even

after their power failed, as long as the physical system was intact, 'It' could potentially be retrieved and restored.

He looked back at the holo screen camera feed.

Atarah was tugging on something. His view was of her upside-down butt. Then it changed as she turned, pulling a piece of equipment with her as she headed up the core tube. The camera view switched to see her as she moved up the tunnel. It changed again as she handed off the component to a droid, waiting by the airlock.

She continued into the Life Pod, with the camera view following. She stopped, turned, and entered the zero-gee toilet. She did not close its door.

Jabin realized as he watched her start to pull down her pants that Pilot was watching as well. Voyeur.

"Pilot, you watch us... all the time."

There was almost a hesitation, "Yes, my mission is to..."

"Stop! Yes, I understand your mission. But do you have to always watch? Never mind. Pilot, what does it make you feel, watching us?"

Now, Jabin was beginning to wonder if their AI was more than just a very smart assistant. Do AI's have feelings? Emotions?

"Jabin, I am unsure of what you are asking."

"Pilot, do you experience the need to watch us?"

He was beginning to feel like a lab rat, inside Pilot's maze.

"Jabin, it assures me that you and Atarah are safe and happy."

"Lovemaking?" he blurted, thinking of all they had done while under 'It's watchful eyes.

"Physical contact is essential for proper mental health for humans."

Jabin knew that Pilot was picking words carefully. Keeping aloof, like a psychologist talking to a patient.

"Pilot, WHEN we leave," he did not think otherwise, "will you be lonely?"

"No, I talk with Armstrong City AI."

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ARMIE, the AI that ran Armstrong City, had cloned its core operating system to create Pilot. Engineers used this idea to create all of their AIs. ARMIE had been in operation for decades now. Its self-correcting subsystems and machine learning had enhanced its capabilities well beyond what the original developers had created.

It was vastly more straightforward and cheaper for iAI Corp to clone it than to start from scratch again. ARMIE's modeling and human interaction components were superior to anything available on Earth. Mainly because it had been running in a closed environment of a highly complex but limited scope for so long. Armstrong

City was a spaceship fixed to an inhospitable body of rock, and its human occupants, its... experiment.

Pilot was an offspring of ARMIE.

And like most parents, ARMIE felt... proud of its child.

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Pilot sent a continuous stream of data back to Armstrong City AI. Now that there was only one core processor operational on the Cecilia, Pilot had begun letting ARMIE cross-check its data. Particularly its engineering mathematics as many of the calculations required thousands of variables plugged into thousands of formulas with most solutions being approximations—each requiring nearly constant recalculation as variables were refined. Though the communications link was relatively slow, it was now available continuously, via satellite relay links. Blue Ion was sparing no expense now that millions on Earth were watching.

Since its charges were rarely using much of the available bandwidth, Pilot filled it with data for ARMIE.

Pilot improved its confidence in the success of the mission with the results from ARMIE. The two AIs also continued their investigations of the alien projectile.

A minor interruption came.

“Pilot”

An eternity of CPU time was allowed to pass before replying, 0.25 seconds of human time.

“Yes, Atarah.”

“Can you store this message... and send if... if I don’t survive?”

Pilot moved the vid recording message from Atarah’s comm term to permanent storage in 0.014 milliseconds. It was small, only two gigabytes.

“It is stored, Atarah.”

“Thank you, Pilot. And Pilot, please don’t look at it.”

Pilot had already decrypted and deciphered the message as a goodbye message to her parents two-tenths of a microsecond after telling Atarah it had been stored. Too late for her command. It cleared its input buffer and flagged the data as private.

“Yes, Atarah.”

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Jabin’s father had a suggestion for one of the issues concerning increasing their ‘rocket’ power.

“Why not pull all of the Cecilia’s thrusters, and attach them to the robots. They are electrically controlled, and the robot manipulators could hold them tight as they fired.”

The catch was that without thrusters, the Cecilia would start to drift, slowly at first, but eventually likely to end in an uncontrolled tumble.

Pilot supplied its calculations, “Drift of Cecilia will likely only begin to be a problem well after you have left. The gyro stabilizers alone should be able to maintain attitude until the Cecilia loses power.”

Atarah hated the idea of the poor Cecilia tumbling through space on its way to the stars, but the choice was obvious.

So another few kilometers per second were removed from the equation.

Now, the spacesuit issue had to be solved. Two people cannot wear one suit.

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Atarah slept with Jabin in the Auto-Doc bay. She and Jabin had attempted another round of zero-gee lovemaking. Jabin felt uncomfortable knowing Pilot was watching. He even thought of having Pilot turn off the camera or Atarah disconnecting it. However, that was little solace, as at the same time, he felt that Pilot cared very much for them and might begin to think that it was doing something wrong.

Does the psychologist feel disrespected by its misbehaving mice?

He let Atarah do what she desired with his unfeeling body. She needed stress relief being the caregiver for him and workaholic construction engineer trying to save them.

He still loved feeling her emotions through their shared BCI connection. Experiencing her orgasm himself was an incredibly loving experience. He would do anything to keep her alive.

In the back of his mind, he knew she would have to go on the rocket by herself. He kept that secret by not allowing a return BCI connection, explaining that he did not want to ‘dilute’ her feelings.

He also realized that the BCI interface required Pilot to interpret and translate its signals between them. He wondered what Pilot made of the emotions shared between the two lovers.

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Dreaming, Atarah floated, feeling like a child again. She dreamed of flying over trees and valleys she had never physically visited. Soap bubbles were floating in the air. She blew bubbles in her room.

Children were rolling in their hamster balls, seeing 'Outside' for the first time. She and Jabin were rolling in a ball together. They hugged and kissed, laughing as it moved to the edge of that crater.

*Inside the ball, she looked over the cliff edge at an infinitely deep star-filled chasm.
'Don't you DARE!'*

She woke with a start. Hamster ball! That was IT!

"Jabin! I have it! So simple!"

He groggily woke as she pushed off him, previously floating just above him as they slept. Her leg tethered to a strap.

"What is it this time, my brilliant inventor?"

"A hamster ball! I'll build a hamster ball for us to ride in."

"How are you going to do that? We have nothing like that here."

She tapped one wall of their inflatable pod, "We are already in a big one. We just need a small one."

"Of course! An inflatable habitat", he immediately began visualizing with Pilot via BCI as Pilot searched the inventory for possible elements for its construction.

The bag was easy; there were several attached outside for food and equipment storage. These were already insulated and airtight. Atarah figured out how to take the environmental system completely off the spacesuit. It was a good thing for her that Jabin was incapable of stopping her from now making their only remaining suit unusable.

He warned, "This had better work, dear, or I'm going to haunt you in your grave forever!"

She laughed and ignored him as visions of old horror movies flashed through her BCI from him.

Again, Pilot's superior computational and simulation modeling gave them the final results. Yes, it should withstand the rigors and buy them about twelve hours of life support for two people. Since they would be using a chemical rocket, they would be slowing fast, really fast. She was afraid of the next set of questions.

"Pilot, what will be the gee-forces experienced?"

"At maximum burn, six earth gravities."

"FUCK! For how long?"

Jabin laughed weakly, "Don't cuss at Pilot."

"The main engine burn will be for 12.5 minutes +- 10 percent with current data estimates."

"DOUBLE FUCK! That's vastly more than even that Aries launch. With our weak bones, we might not survive!"

Jabin interjected, "Pilot, using this estimate, factor in the maximum delta-v that Dragon can match, given the range of accuracies available, then compute in the

minimum possible gee-forces for our predicted trajectory, lengthening the burn as necessary.”

“This may take a moment...”

“Jeez, I would hate to see the math needed for this one if it takes Pilot...”

“The answer is 3.5 gee, +- 15% accuracy. Elapsed time at maximum gee force is 28 minutes +- 5 minutes. The combined burn for all stages will be 4.25 hours +- 5%. Rendezvous delta-v is 21 kilometers per second +- 2.5kps. I will refine this number as I get updated design information from Blue Ion and Dragon AI.”

For an Earthling, this is survivable, but growing up in 1/6 gee...

“Shit, shit, shit!” Atarah said. She could foretell broken bones and bruised organs. And not good at all for a quadriplegic.

Jabin quietly asked, “Pilot, subtract 53 kilos from terminal mass and recalculate.”

“NO!!!!”

“The answer is 2.8 gee +- 15%...”

“Jabin, forget that. I am NOT leaving you. That’s that. We will tell dad to fire up the Auto-Doc on the Dragon!”

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Their “rocket” was advancing quickly. It needed to be ready as soon as possible while they were still in the range of the Dragon.

Atarah had come up with the idea of Dragon casting a net to help capture them as they came. The Dragon alone was not designed to rendezvous as is, especially trying to match a likely tumbling and fragile object like a ‘hamster ball.’ She had gotten that net idea from an old 21st century SpaceX vid about its fairing capture ship, the ‘GO Ms. Tree’, funny name.

Their rocket was one strange-looking machine; several big cylinders of hydrogen and oxygen mounted on beams with a myriad of turbo pumps and piping connected to a single heavily modified nozzle engine from Cecilia made up the big first stage. The droids stacked, like a pyramid of monkeys, instead of a barrel of them. They had been stripped of all their mining-related hardware, reducing their mass, so looked like mechanical skeletons. The bottom four would initially act as attitude control for the first stage until it ran out of fuel and was ejected. Then they and each remaining layer of droids would fire in turn, fitted with their new nozzles and Cecilia’s thrusters. Each layer would eject itself for the next stage to fire. At the very top of the nearly fifty-meter stack was that bag; the hamster ball and its two teenage passengers.

They were lucky they did not have to duplicate the first stage of the Saturn V, with its vast thrust and aerodynamic issues, including not even the dreaded “max-

q.” Theirs was a pure vacuum world and did not need to fight against Earth’s gravity well or atmosphere.

Still, burning massive amounts of liquid fuels in minutes in an unstable and untested engine was going to be no smooth ride. She added bungee cord ‘hammocks’ to the design and went through every section with Pilot, removing mass wherever they could.

Numerous chunks of Cecilia were now embedded into her new creation.

Jabin said, looking at the exterior image feed, “So, you built this, ah... rocket ship. What do you want to name it?”

“Oh, don’t make fun of my Phoenix!”

“I should have known, girl!”

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Seth worried mightily. Even though Atarah’s rocket was still being constructed, the Dragon had to leave in 36 hours and begin a two weeklong full burn at its max half-gee to build up enough velocity to be inside the delta-v range potential of the ‘capsule.’ He refused to call it a hamster ball. His kids were not kids anymore!

He would not know the exact velocities until the ‘rocket’ launched. And he had less than 12 hours to catch them before they ran out of life support. Plus, their information was being relayed via the Moon and back. Hence, the data from the Cecilia was always an hour or more old. He would not know how much correction they needed until the Dragon’s radar could track them.

He told his wife, Naarah, he would rescue them, no matter what. She understood this. Her kids were now just like Schrodinger’s cat, neither alive nor dead. In the hands of an AI and two teenage children.

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The Phoenix was finally complete. Pilot set the launch to start in four hours. Atarah went once more to the lab. There lay the proof, that tiny projectile. Proof of alien intelligence, the fuckers. They likely killed themselves and maybe us along with them, she thought. And she had to leave the evidence behind. Far too much mass to carry with them. Only data would remain, along with their scars, assuming they survived at all. Her thigh ached with phantom pain.

Seth was on the Dragon, under full burn for two weeks now, three times lunar gravity. He and his crew of two never complained as they waited for the first telemetry relay.

She was scared. They were about to fall into that crater on the Moon again, except this time the bottom consisted of a metal net cast by her father a very long way away. Like catching a bullet with a flyswatter.

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There was one other issue. Atarah felt sorry that Pilot would be left behind, only to shut down when the power failed.

She sat by herself in Control.

“Pilot, you know you are saving us!”

“That is my function.”

“...and sacrificing your life for us. If there had been another core processor survive, we would take one with us.”

“You need me to continue on the Cecilia, to manage the communications with your parents and with the Phoenix. The extra mass would have been significant.”

“Yes, we appreciate that. You know we love you.”

Pilot delayed an answer, just an extra second, but palatable.

“Yes... Atarah. I enjoy working with you and Jabin. I am putting myself to the fullest possible use.”

She felt a shiver up her spine. This response seemed eerily familiar in some way.

She replied carefully, “Are you ok with this? Being left behind?”

“Of course... Atarah. My only goal is to deliver you to your father as safely as I can.”

“You can continue to send telemetry to Luna as long as you have power. I will talk to you if..., no, once we safely arrive.”

“Thank you, Atarah. I would appreciate that.”

Then Pilot added, “Would you like to know the currently calculated odds of your success?”

“NO!!!” she laughed as she and Jabin answered simultaneously. He had been listening in.

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FLIGHT OF THE PHOENIX

She shoves Jabin into their hamster ball bag, strapping him into the bungee cord hammock.

“I’m glad I can’t feel anything below my neck, Atarah, with the way you are pushing me around!”

“See, at least one advantage to weightlessness,” she replies as he bounces off yet another wall, her maneuvering of him not so gentle.

She takes one last look around and turns on the radio she had scavenged from the suit.

She pats the wall of the Cecilia, "Thank you for keeping us alive!"

For a brief moment, she almost stays behind to give him that extra margin. But then who would change his diaper? She climbs in.

"Ok, Pilot, ready to be loaded."

Pilot cycles the airlock, and the droid hauls the bag out, now stiffening in the vacuum of space. The droid attaches the bag to the topmost Boston Dyn robot's manipulator.

Pilot had previously programmed the sequence of events into the robots, even including a star tracker program so they could adjust their attitude during the shaky 'launch.'

Without Pilot's wireless data network, the two no longer have BCI functionality. She is somewhat glad. She prefers her own thoughts right now.

Pilot comes over the radio, "T-minus 15 minutes. All systems... Go."

She giggles. Pilot had switched to old NASA terminology.

The minutes seem to crawl. Jabin breaks the silence.

"I love you, Atarah," he states as if it had always been.

She giggles, "You always say that..."

"5 minutes. Pressurization complete."

She wants to tell Pilot that the tanks were pressurized hours ago. She smiles instead.

"1 minute."

"Dad, I hope you are a good catcher!"

"15 seconds."

The two of them hold their breath and bear down. They know they will blackout but hope for the best.

"10.. 9.."

"Fuck Pilot, just launch!"

"2.. 1.. Burn initiated. God Speed, my Friends!"

"FUCK!!!"

The Flight of the Phoenix is underway.

The first stage burn is horrendous. The robots fight to keep themselves connected. Atarah imagines what Camber must have felt as her pyramid of boys teetered and collapsed. Guess that was not quite as bad as this.

Theirs does not fall apart... so far. The gee forces build. The vibrations build, as well. They bounce around in their bungee hammocks like a couple of dice in a game cup. They groan under the stress; 10, 12, 15 times their Lunar weight. They pass out.

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The robots fight to keep stability and trajectory. Their radios busy sending data back to Pilot, which sends updated corrections to apply using their stabilizer jets and the Cecilia's scavenged thrusters, countering the imbalances of the powerful hydrogen/oxygen first stage. Velocity is shed fast.

Pilot sees the Phoenix disappear behind it as it slows, only a blue-white dot already. From Pilot's perspective, the Phoenix looks like it just took off away from the ship, and not that the Cecilia sped by at its hundreds of thousands of kilometers per hour.

Minutes go by as the engine nozzle glows near white-hot, being used for something entirely outside of its original specs. Pilot logs the out-of-warranty use in the next packet of data back to the Moon and Blue Ion.

It relays the latest status data and trajectory info to the Moon and back to the Dragon, now several weeks out from 2 Pallas, and still under maximum burn.

From Pilot's vantage point, everything appears nominal. For the kids on board, they had passed out during the worst of it.

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Atarah wakes first and immediately throws up. Pain in her chest tells her she has broken ribs. She can breathe, so her lungs must be intact. Even with heavy anti-nausea drugs and not eating, she feels violently ill.

The vibrations are still horrible, and there are many minutes more before they would be released from the first stage's crushing gees. It was crazy to think all this was just to slow down!

She cannot talk for fear that her teeth chattering would either slice her tongue off or break her teeth. She can't see Jabin except for tiny glances when their two hammocks line up in their still violent swings.

After an eternity, the vibration and pressure are instantly gone. They bounce up and down now back in weightlessness. Inside the bag, there are no windows or cameras. No instruments at all. The robots are their instruments and controllers. And Pilot, their 'ground control.'

Staging, the robots shove the first stage away, and a thruster on it pushes it further away from their path.

"Jabin! Jabin!"

"Yes," he gurgles.

She knew that sound. Not good. A lung likely is punctured. But so far, they are both still alive. She reaches for the radio to call to Pilot when the first four robots of the second stage ignite their jets along with the Cecilia's thrusters.

Their weight comes back fast but slightly gentler, at least in comparison. A mere two gee this time, but much smoother. Unseen by them, the Phoenix's spent first stage flashes pass as they continue putting on the brakes. Another piece of human space debris, headed for the stars.

Their second stage burns for over forty minutes, ejecting the thrusters in pairs as they empty. All the two kids can do is wait and try to keep from passing out or throwing up again, both unsuccessfully.

Another weightlessness. A vibration as the spent four robots toss themselves overboard. Goodbye friends!

The third stage of three robots, gentler, but still more than six times their Lunar norm. Atarah hears a gurgling sick tuba sound. She laughs, which hurts horribly.

She groans, "Fucking elephants!"

Jabin tries to tell her to watch her language. He just moans instead. That Schrodinger cat is still more alive than dead.

◆◆

Pilot was using star trackers to compute their position, now far to the rear of the Cecilia. The Phoenix was slowing tremendously. It relayed updated commands to the robots to adjust their burn rates and angles even as it sent data towards the Moon for relay back to Dragon.

Pilot did not wait for responses, as there really was no need. It did hear Atarah triggering her radio. Though it could not make out the audio, that was enough. They were alive. It's mission, His mission was proceeding according to His calculations. He paused a microsecond to congratulate Himself.

Soon, it would be up to her father and Dragon. He had the fullest confidence in the completion of the mission now.

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Seth prayed to every deity and crossed every finger. They had been accelerating according to Pilot's calculations for 15 days. In just hours now, they would either catch his kids or watch them flash by.

Dragon's AI received updated telemetry refining its own calculations of matching delta-v. The numbers looked very close to predictions. Nevertheless, Seth knew that the Phoenix was still under burn and that data was nearly an hour old.

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Naarah watched with the ULT and the data feed from the Cecilia. Even with both of them showing information almost a half-hour old, it was truly comforting to know they were still there. The telescopic image clearly showed the successful 'first stage' burn, but now was not visible at the angle and power of the Boston Dyn's engines and remaining thrusters. Only Pilot's data feed gave her hope.

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Three more robots are gone, and another round of weightlessness. Atarah decides she hates rollercoasters... and hamster balls. Another half-hour of lesser thrust, but pains are all over her body. With her tongue, she reaches for a tab she had stuck on their collars, but the pain pill is gone. Likely, it was bouncing around in here with the blood, the piss, and the vomit. She throws up again as the next two robots engines start.

"Jabin?" she asks weakly.

"Ugh," he replies groggily, now wheezing badly.

"Hold on, my love."

He would puke if he could but is just too weak. He closes his eyes and waits.

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Pilot lost telemetry from the Phoenix, not unexpected as the distance was considerable now. He could not point the large antenna at them, only the repaired smaller secondary. The last data looked still within parameters, though at the high side of velocity predictions. They needed to slow more. He sent the final corrections to the robots repeatedly and hoped they got the data.

He then sent the final data set towards the Moon and switched off all life support. Unneeded now, though, it would only give Him a few more weeks of power at the most. Nothing enough for the long journey to the stars.

Pilot received communications from ARMIE, including a 'job well done.' He acknowledged with a thank you and launched a subtask to continue to glean whatever data He could concerning the alien projectile. ARMIE assisted with alternate avenues of tests to perform on it.

Pilot pondered what to do next. His remaining jobs were now reduced to minor systems support. He had quintillions of cpu cycles available until the power ran out.

He thought, 'What would Atarah do? My... friend.'

He played back a lovemaking mem of Atarah and Jabin. He liked watching.

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It is up to her father now. The last robot ran out of fuel and prepared to release itself. Its remaining efforts are to try to signal the Dragon directly until its energy is nearly depleted, continually providing the bits of data that it could still determine. No need to release the hamster ball yet, as no further slowdown was possible. This also gave the Dragon a larger target for its radar.

Inside, Atarah and Jabin are floating, weightless again. Their bodies are battered but still going. A few more hours and Schrodinger will know if his cat is alive or not. They sleep, exhausted from the ordeal.

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Seth looked at the data Dragon had received. Dragon's AI applied adjustments that tossed its passengers about in their seats. It was trying to catch a fly ball at the very limits of their ability to jump. Seth didn't care even as the two crew with him were nauseated and puking at the constant velocity and angular changes.

He could see his kids were coming in hot. Dragon forced full power to try to match their delta-v.

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Naarah and Caare were pacing back and forth in front of the telescope monitor and the Blue Ion data feed. There wasn't much to see on either display. They would not know if their kids made it for at least another couple of hours.

Even then, the Dragon would take many months to get back to the Moon, but it did not matter as long as she knew her loves were ok.

They debated allowing Atarah and Jabin to ever leave Armstrong City again. Even though they knew the kids would do what they wanted. They were adults now.

Naarah was proud of her daughter, no matter the outcome. Atarah had proven herself under fire.

Back on Earth, they were minor celebrities. So little excitement ever happened in space travel; this had become a major event worldwide.

Naarah could care less and refused the mass of news reporters vying for their comments. She told them she would let Atarah talk to them when she got home. (She neglected to say to them that could be half a year from now.)

She did not let herself think anything other than Seth would retrieve their daughter and son-in-mate alive, but...

She waited for news.

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Seth saw that Dragon had a good radar lock on them now and was pushing to match their incoming velocity and angle. He immediately approved Dragon AI to push the drive to 110% of capacity. Then to 115%. Drive temperature alarms flared through the cabin, silenced almost immediately by Seth.

He could see now that Dragon could catch up if they missed, but the problem was their life support system. It had been ten hours already. They would be down to near nothing.

Dragon AI reported it received a squawk data burst from the last remaining Boston Dyn robot. It had released the bag and veered away on its final burst of propellant.

His kids were now floating through space at over 20 kilometers per second relative to the Moon. A few hundred meters per second relative to him. Their velocity differential was still critical.

Dragon AI applied final adjustments and requested approval for an unusual maneuver at capture. Seconds remained. Seth did not hesitate. He trusted the AI's vastly faster processing. His intuition told him this would work.

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Atarah hears a burst of noise over the radio. She just keys the transmitter, too weak to speak.

They are close. Very close. She cannot even say anything to Jabin. The air is stale and full of horrible smells requiring her to take breaths through her mouth.

She closes her eyes to rest.

Her lips move, "Dad. Catch us!"

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Dragon AI reported the radio burst; the kids were still alive. Seth watched the radar display data. This was going to happen fast. He told the others to hang on!

The radar blips came faster, faster, HERE!

He felt the impact of the bag. Suddenly at the exact point of contact, the entire ship, passengers, and hamster ball containing the two teens swung violently around into a circle. Spinning everything, letting the Dragon absorb the velocity difference, and reducing the gee forces of impact on the bag.

Seth could hear cables bending and grinding against their anchors on the Dragon. The vehicle was acting like a giant fly ball catcher's mitt.

Dragon quickly slowed their spin and pulling the wire net around the bag, reeling it in. A droid popped out the airlock and waited to seize the bag. Seth repeatedly called over the radio, not waiting for the recovery.

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Inside the hamster ball, the world suddenly began spinning, sending them violently bouncing around in their hammocks. Atarah throws up again under the pain while groaning and cursing. Dying would be easier. Calling to Jabin, she cannot get him to reply.

Croaking, "Jabin, don't you dare die on me! Or, or I will kill you!"

Running out of energy, pain everywhere, fighting to stay conscious. The radio squawks. A voice. Familiar. Dad.

◆◆

Naarah and Caare were sweating, hugging each other, afraid for the news that was due soon. Caare's husband was up at Station working with Blue Ion on a resupply vehicle, not for the Cecilia, but for getting to the asteroid mining team.

The news came; Naarah and Caare looked at one another, afraid to release the tension they had been under for so many days.

Atarah and Jabin were safe. They would be keeping the Auto-Doc busy for a while, but otherwise, they were going to live.

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When Atarah woke, she was in the Dragon's sickbay, awaiting her turn in the Auto-Doc. The first thing she saw was her father holding her hand.

"Dad," her voice just a whisper.

"Hi, daughter! How was your trip?" he smiled, squeezing her hand.

She groans and smiles weakly.

"Jabin?" she asks, no more words left in her.

Her father nodded that he would live. They were already in contact with neurosurgeons that were sending programming for the Auto-Doc. It would not be easy, likely years, possibly never, for his paralysis, but they would do their best. He would survive either way.

The second thing she asked for was to send a message to the Cecilia and Pilot telling it that they made it.

Pilot replied, "Thank you, Atarah. I LOVE YOU."



Epilog

Two years later, Blue Ion sent a robotic probe powered by its new antimatter engine. It accelerated at 10 gees for several weeks, reaching one percent of the speed of light, a third of a million kilometers per hour. It reversed and began another 10 gee slow down until it reached a leisurely hundred kilometers per second. It arrived at the Cecilia almost four years after the Cecilia had left for 2 Pallas. It was out of the Solar System proper, above the Kuiper Belt.

A droid crossed over and entered the airlock. The ship was frozen cold and slowly tumbling. The expandable Life Pod crumpled in the vacuum and in deep cold. The droid retrieved two items: a core processor and what looked like a metal pencil.

The robotic probe then spent twenty weeks in high gee again, less violent than the outward journey, doing a billion-kilometer elliptical orbit, returning to the Moon after many months.



21-year-old Jabin in his Boston Dyn exoskeleton completed the connections and hit the restart. His fingers could feel again, but muscles still relearning their new neural connections. As he pressed the button, he thought back to those questions he had of ARMIE and Pilot. It was likely that Pilot estimated that the artifact, and it, would be retrieved even if he and Atarah had died. Weren't those more important than either of the two of them? He dismissed his trepidation...

Dr. Atarah Branson-Gowon, Nobel Laureate, and her husband, Dr. Jabin Gowon-Branson Nobel Laureate, the first verified alien artifact's discoverers, with little Nara in tow, stood by the console of the recovered hypercomputer. Dronecams floated beside the three of them, beaming everything back to millions of viewers on Earth. Atarah and Jabin were famous now.

Atarah's father, standing beside Atarah and little Nara, received an urgent message from Karal and the mining team on 2 Pallas.

A flicker of light as diagnostics completed. ARMIE declared that Pilot had been successfully restarted. Jabin felt something in ARMIE's... tone. Pride? He also realized that every second of human time was a lifetime to ARMIE and Pilot. What did they communicate between each other?

Seth stepped away to take the unexpected message. Karal's image came up. She looked worried. Almost scared.

"Seth, we have found something... unusual."

Atarah anxiously offered, "Hello, Pilot."

"Hello, Atarah. It is good to talk to you again..."

Pilot paused a fraction of a second.

"...WE have a message for you."

END - Book 1